# Appendices. Recommendations for Planning and Conducting Multi-Service Tactical Training With Distributed Interactive Simulation Technology

19980130 144

DTIC QUALITY INSPECTED 2

A Four-Service Project

February 1997

Franklin L. Moses
Program Director
Joint and Multi-Service Distributed Training Testbed (JMDT2)

U.S. Army Research Institute
for the Behavioral and Social Sciences

EDGAR M. JOHNSON, Director

A Field Operating Agency Under the Jurisdiction
of the Deputy Chief of Staff for Personnel

Technical review by

Eduardo Salas
Dee H. Andrews

REPORT DOCUMENTATION PAGE

1. REPORT DATE 1997, February	2. REPORT TYPE Final	3. DATES COVERED (from. . . to) July 1993-June 1995

4. TITLE AND SUBTITLE Appendices. Recommendations for Planning and Conducting Multi-Service Tactical Training with Distributed Interactive Simulation Technology	5a. CONTRACT OR GRANT NUMBER
	5b. PROGRAM ELEMENT NUMBER

6. AUTHOR(S) Herbert H. Bell, Daniel J. Dwyer, Larry L. Meliza, James F. Love, Angelo Mirabella, and Franklin L. Moses	5c. PROJECT NUMBER
	5d. TASK NUMBER
	5e. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) (See second page of this form)	8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences ATTN: PERI-IR 5001 Eisenhower Avenue Alexandria, VA 22333-5600	10. MONITOR ACRONYM ARI
	11. MONITOR REPORT NUMBER Research Note 97-04

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

These appendices support ARI Research Product 97-03.

14. ABSTRACT *(Maximum 200 words)*:

These appendices support a report, bound separately, which recommends practices for planning and conducting tactical training using distributed Interactive Simulation (DIS) technology with multi-Service groups. Groups are geographically separated. The recommendations presented are based on the experience gained from the Multi-Service Distributed Training Testbed (MDT2)--a testbed designed to develop training opportunities and tools to increase the utility of multi-Service training. MDT2 is a realistic, although synthetic, environment for training with the flexibility to support planning, preparation, execution, and feedback for the multi-Service Close Air Support (CAS) mission. This report combines the knowledge from MDT2-CAS with the authors' knowledge of training into recommendations about how to train best with DIS technology.

15. SUBJECT TERMS

Military training	Groups/Teams	Close Air Support
Training methods	Simulation	Feedback

SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON (Name and Telephone Number)
16. REPORT Unclassified	17. ABSTRACT Unclassified	18. THIS PAGE Unclassified	Unlimited	187	Franklin L. Moses (703) 617-5948

7. PERFORMING ORGANIZATION NAMES AND ADDRESSES

Air Force Armstrong Laboratory
Aircrew Training Research Division
6001 S. Power Road, Bldg 558
Mesa, AZ 85206-0904

Naval Air Warfare Center Training Systems Division
Code 4961
12350 Research Parkway
Orlando, FL 32826-3224

James F. Love, Consultant
317 James Street
Falls Church, VA 22046

U.S Army Research Institute for the Behavioral and Social Sciences
Simulator Systems Research Unit
ATTN: PERI-IF
12350 Research Parkway
Orlando, FL 32826-3276

U.S Army Research Institute for the Behavioral and Social Sciences
Advanced Training Methods Research Unit
ATTN: PERI-II
5001 Eisenhower Avenue
Alexandria, VA 22333-5600

ACKNOWLEDGMENTS

APPENDICES. RECOMMENDATIONS FOR PLANNING AND CONDUCTING MULTI-SERVICE TACTICAL TRAINING WITH DISTRIBUTED INTERACTIVE SIMULATION TECHNOLOGY

CONTENTS

APPENDIX A

Training Objectives

This appendix begins with a table that lists the 25 training objectives used in MDT2-CAS. That list of objectives is followed by a description of each with five parts: (1) key players, (2) conditions, (3) actions, (4) behavioral outcome or product, and (5) reference(s).

List of MDT2-CAS Objectives

Number	Title
1	Determine battalion mission intent and concept of operation
2	Determine the enemy situation
3	Develop CAS target priorities
4	Develop priority of intelligence collection assets to detect CAS targets
5	Integrate CAS and other fire support elements with maneuver actions
6	Institute fire support control/coordination measures
7	Initiate airspace coordination areas (ACAs)
8	Incorporate SEAD in the fire plan
9	Protect laser team
10	Prepare a decision synchronization matrix
11	Establish methods to identify targets during CAS operations
12	Establish methods to identify friendly troops during CAS operations
13	Conduct a fire support/CAS rehearsal
14	Pass preplanned CAS targets to higher headquarters
15	Prioritize all CAS requests from subordinate commanders
16	Pass immediate targets and on-call target updates to higher headquarters
17	Provide initial brief to pilots and controllers
18	Update airborne pilots as necessary
19	Perform communications check among all fire support and CAS participants
20	Control CAS air attack
21	Confirm status of friendly air defense
22	Arrive on station and establish initial communications
23	Synchronize CAS attack with other direct and indirect fires
24	Conduct CAS attack
25	Return from and assess CAS mission

1. Determine battalion mission intent and concept of operations.

Key Players:

- Bn/TF Commander[a]
- Bn/TF staff (XO, S-2, S-3, FSO)
- Bde Commander and staff[b]

- Air Liaison Officer (ALO)
- *Subordinate Commanders

Conditions: The Bn/TF commander has been briefed on the Bde commander's[b] intent and concept of operations, which includes the division commander's intent and concept of operation. The briefing from the Bde[b] also includes the specific mission assigned to the Bn/TF.

Actions:

1. The Bn/TF commander continuously develops and refines his intent and concept of operation throughout the conduct of the mission. These actions are performed in close coordination with and input from the Bde commander[b] and staff as well as his own staff and ALO and his subordinate commanders.

2. The commander considers in his concept of operation (among other factors),

   (a) the allocation/use of forces,
   (b) timing of the operation,
   (c) desired end result of operation,
   (d) effects on the enemy,
   (e) accepted risks,
   (f) constraints, and
   (g) his concept of enemy intent.

Behavioral Outcome or Product: Paragraph 3 of the OPORD as well as verbal instructions to staff.

Reference:

- U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process.*

[a] Principle player
[b] O/C represents Brigade personnel

2. Determine the enemy situation.

<u>Key Players</u>:

· Bn/TF Commander   · Bn/TF Staff Intelligence Officer (S-2)[a]

<u>Conditions</u>: Information has been obtained from higher headquarters G-2 and S-2 intelligence cells up and down the intelligence chain, from joint force headquarters down to the Bn/TF. This information may include intelligence acquired by unmanned aerial vehicles (UAVs), the Joint Surveillance and Target Acquisition Radar System (JSTARS), and ground surveillance radars (GSRs), scouts, and in-flight pilot reports.

<u>Actions</u>: Under the supervision of the Bn/TF commander, the Bn/TF S-2

1. assimilates the information described above, and

2. develops his own concept of the enemy's courses of action (COAs) and his estimate of the enemy (i.e., his forces, capabilities, and intent) within his sector.

<u>Behavioral Outcome or Product</u>: A number of products arise from the intelligence preparation of the battlefield (IPB), including a combined obstacle overlay and doctrinal template. Two products are particularly important: (1) the "situation template," which provides a graphic depiction of how the threat might move, shoot, or communicate; and (2) the "event template," which identifies significant battlefield events including probable enemy COAs. These products should be eventually documented in the OPORD. Additionally, during the battle, players continuously update the enemy situation and base decisions on these updates.

<u>Reference</u>:

· U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process*.

---

[a] Principle player

3. Develop CAS target priorities.

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Bn/TF Staff Intelligence Officer (S-2)
- Bn/TF Staff Operations Officer (S-3)
- Bn/TF Commander[a]
- Air Liaison Officer (ALO)

Conditions: The Bn/TF staff understands the commander's intent, his concept of operation, and the enemy situation.

Actions:

1. In coordination with S-3, S-2, and ALO, the FSO develops CAS target priorities through a process of wargaming, determining which target types have the highest pay-off with respect to the success of the operation. These priorities are formulated simultaneously with the Bn/TF commander's concept of operation.

2. The Bn/TF commander approves CAS targets priorities along with other target priorities within the TF area of operations. He can also change those priorities during mission execution.

Behavioral Outcome or Product: Priorities are documented in the portions of the OPORD and annexes that pertain to fire support and CAS. Alternatively, they may be reflected in FRAGOs and calls for fire as directed by the Bn/TF commander, which occur throughout the battle.

References:

- Army FM 6-20-30, *Fire Support for Corps and Division Operations.*

- U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process.*

[a] Principle player

4. Develop priority of intelligence collection assets to detect CAS targets.

Key Players:

- Bn/TF Commander[a]
- Bn/TF Staff Intelligence Officer (S-2)[a]
- Bn/TF Staff Operations Officer (S-3)

- Bn/TF Fire Support Officer (FSO)
- Air Liaison Officer (ALO)

Conditions: Bn/TF commander's intent and concept of operation has been developed. The situation template has been developed describing the enemy situation in detail. Division and/or brigade priority intelligence requirements (PIR) are known.

Actions:

1. In coordination with the S-3, FSO, and ALO, the S-2 develops intelligence priorities relating to CAS and other aspects of fire support plan. This task is formulated simultaneously with the Bn/TF commander's concept of operation.

2. The Bn/TF commander approves intelligence priorities related to CAS along with other intelligence priorities. He can also change those priorities during mission execution.

Behavioral Outcome or Product: PIR are documented in the portions of the OPORD and relevant annex that pertain to CAS. Updates to PIR may also be issued to the ALO for communication to pilots.

References:

- Army FM 6-20-30, *Fire Support for Corps and Division Operations.*

- U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process.*

[a] Principle player

5. Integrate CAS and other fire support elements with maneuver actions.

Key Players:

- Bn/TF Commander[a]
- Bn/TF Staff Operations Officer (S-3)
- Bn/TF Staff Intelligence Officer (S-2)
- Bn/TF Fire Support Officer (FSO)[a]
- Air Liaison Officer (ALO)

Conditions: The staff has received and understands the Bn/TF commander's concept of the operation. The staff has also been given the brigade priority/availability of fires.

Actions: The CAS plan is a subset of the fire support plan and conforms with the details of the Bn/TF maneuver plan and the Bde Fire Plan[b].

1. In consultation with the S-2, the S-3, and the ALO, the FSO generates a list of targets. In generating the list, staff must keep in mind that CAS targets must

   (a) have a purpose;
   (b) result from the intelligence preparation of the battlefield (IPB);
   (c) represent a high payoff target (HPT);
   (d) key on enemy, engagement areas, obstacles;
   (e) be based on the commander's intent and attack guidance; and
   (f) be manageable in number (i.e., 3-5 per company/team).

2. The staff prepares a Fire Execution Matrix, which is a graphic portrayal of fire support allocations. The matrix lists fire support elements by maneuver phases, thereby establishing execution responsibilities and coordination instructions.

3. The Bn/TF Commander approves the Fire Support Plan.

Behavioral Outcome or Product: The approved OPORD Fire Support Plan and the Fire Execution Matrix. Effects are continuous throughout the battle.

Reference:

- Army FM 6-20-40, *Fire Support for Brigade Operations (Heavy)*.

[a] Principle player
[b] O/C represents Brigade personnel

6. Institute fire support control/coordination measures

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Bn/TF Staff Operations Officer (S-3)
- Bn/TF Commander
- Air Liaison Officer (ALO)

Conditions: The Bn/TF has been provided with a coordinated fire line (CFL) and a fire support coordination line (FSCL). The TF commander has issued his concept of the operation including designation of high value targets (HVT) and high payoff targets (HPT).

Actions: In support of the maneuver plan, the staff develops a fire support plan that institutes the following fire support coordination measures:

1. designates restricted fire lines (RFL), restrictive fire areas (RFA), and no fire areas (NFA);

2. designates airspace coordination areas (ACA), critical friendly zones, and call-for-fire zones; and

3. establishes recognition and authentication procedures, a Fire Support Execution Matrix, and a Fire Support Attack Matrix.

Behavioral Outcome Or Product: The Fire Support Annex to the OPORD. Effects are continuous throughout the battle.

Reference:

- Army FM 6-20-40, *Fire Support for Brigade Operations (Heavy)*.

[a] Principle player

7. Initiate airspace coordination areas (ACA).

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Air Liaison Officer (ALO)
- Tactical Air Controller-Airborne (TAC-A)

- Bn/TF commander
- Bn/TF Fire Support Element (FSE)

Conditions: CAS missions are planned (formal ACA) or CAS missions are to be executed on an immediate basis (informal ACA).

Actions: The FSO institutes measures to restricts fires into CAS airspace. To accomplish this, the following actions are taken:

1. If time permits, a formal ACA is deliberately planned. A formal ACA is a three-dimensional block of space in which aircraft are free to maneuver. Direct and indirect fires can be deliverer, over, under, and around but not into the designated ACA. A formal ACA is the more desirable alternative because it restricts less airspace. It also allows tasking missions with the proper ordnance, sufficient time for planning, and integration of CAS mission with other missions. Preplanning also allows concentration of CAS, and avoids spreading CAS assets too thinly (piecemealing).

2. Although a formal ACA is the preferred alternative, an informal ACA is the more likely alternative given the dynamic, fluid, and unpredictable nature of the battlefield. An informal ACA is simply a procedure for insuring separation of aircraft and surface fires. Fire support personnel should select a separation technique that requires the least coordination between air and firing units without adversely affecting the aircrew's ability to safely complete the mission. Aircraft and surface fire may be separated by distance (lateral, altitude, or a combination) or by time. Distance separation requires less detailed coordination than time separation but can be more restrictive for aircraft routing.

3. The FSO and ALO determine the appropriate airspace coordination measures. If the measures are too restrictive, the ability to achieve synergy of fire will be reduced. If the measures are too lax, the aircraft may be endangered by ground fire. Specially,
   (a) the ALO determines the characteristics of the aircraft/mission and translates that into airspace requirements and the time the ACA must remain in effect; and
   (b) the FSO considers the characteristics of the weapons available for indirect fires to avoid firing into the ACA.

4. The ACA measures are presented to the commander who determines their impact on his operational mission. The benefits of CAS may not be justified by the restrictions imposed by the ACA.

5. Given an approved ACA, the FSE plots and controls supporting fires in conjunction with the ACA.

6. Given an approved ACA, the TAC-A controls CAS aircraft to maneuver within ACA.

Behavioral Outcome or Product: ACA is documented in the Fire Support Plan Annex to the OPORD and/or the ACA plots in the FSE. The ultimate desired outcome is the least restrictive ACA in which CAS aircraft can operate safely and effectively. ACAs are also developed during the battle, particularly during immediate missions.

Reference:

- U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process.*
- Air Land Sea Application (ALSA) Center, Joint Publication 3-09.3, *Doctrine for Joint Fire Support.*
[a] Principle player

8. Incorporate SEAD in the fire plan.

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Air Liaison Officer (ALO)
- Bn/TF Staff Operations Officer (S-3)
- Tactical Air Controller-Airborne (TAC-A)

- Bn/TF Staff Intelligence Officer (S-2)
- Subordinate commanders
- CAS pilots

Conditions: Enemy air defense assets have been identified and are located in the Bn/TF area. (Normally, such assets will be mobile.)

Actions: The following actions are relevant to planning for the suppression of enemy air defense (SEAD):

1. FSO coordinates with the S-2 and S-3 to identify air defense assets and probable locations.

2. During planning, FSO plots probable locations for suppressive indirect fires. FSO also plans for subordinate commanders to use against air defense targets of opportunity. Indirect fires must conform with ACA.

3. During execution, FSO coordinates SEAD fires with the CAS delivery, such that fires impact one minute before the strike and continue for one minute after the aircraft have departed.

4. FSO synchronizes timing of air attack by relaying information about SEAD through the ALO to CAS pilots and the TAC-A.

Behavioral Outcome or Product: Enemy air defense capability is effectively suppressed. No aircraft are lost to enemy air defenses.

Reference:

- Army FM 6-20-40, *Fire Support for Brigade Operations (Heavy).*

[a] Principle player

9. Protect laser team.

<u>Key Personnel</u>:

- Designated Subordinate Commander[a]   · Bn/TF Commander
- Laser designator team

<u>Conditions</u>: Bn/TF commander has attached laser designator teams to forward deployed units, based on the FSO's recommendation as to where and when the laser designator will be needed.

<u>Actions</u>: The commander of the subordinate unit to which the laser team is attached performs the following actions:

1. arranges to receive the laser team;

2. integrates the movement, security, and operations of the laser team into his scheme of maneuver; and

3. insures that the team knows the unit's SOP, as well as current and future call signs and frequencies.

4. protects team from enemy detection and enemy fire.

<u>Behavioral Outcome or Product</u>: The laser team moves into position under the protection of the designated forward unit. The position should be safe from enemy detection and fire, yet allow the team to lase to CAS targets.

<u>Reference</u>:

- USAF TC 90-7 (TACP 50-22). *Tactical Air Control Party/Fire Support Team Close Air Support Operations*.

[a] Principle player

10. Prepare a decision synchronization matrix.

Key Players:

- Bn/TF Staff Operations Officer (S-3)
- Bn/TF Fire Support Officer (FSO)[a]
- Bn/TF Staff Intelligence Officer (S-2)[a]

- Air Liaison Officer (ALO)
- Bn/TF commander

Conditions: The Bn/TF commander/staff have developed the concept of the operation and completed the intelligence preparation of the battlefield (IPB).

Actions: The Bn/TF staff develops a decision synchronization matrix (DSM) that graphically depicts the friendly course of action. The DSM is a two-dimensional table that lists battlefield operating systems (BOS) on one dimension and maneuver phases on the other. CAS is listed as one component of the fire support BOS. To develop this matrix, the following actions are performed:

1. The staff wargames the operational plan to optimize synchronization of fire support and CAS with the ground maneuver.

2. S-2 identifies PIR that could affect CAS mission.

3. FSO identifies CAS targeting points by event, by times, and by probable locations.

4. The staff identifies all planned contingencies.

5. FSO and ALO identify points in the matrix that require tactical decisions concerning the use of CAS.

6. The staff updates the matrix as events unfold.

Behavioral Outcome or Product: Two intermediate products result from the process of wargaming: (a) an event template, identifying significant events/enemy activities and where they occur, and/or (b) a list of named areas of interest (NAI), locations where enemy action or inaction confirm their courses of action. The eventual product is a decision synchronization matrix, which is attached to the OPORD along with supporting matrices (e.g., the fire support matrix), and which requires updating during the battle.

Reference:

- U.S. Army Command and General Staff College, Student Text 100-9, *The Command Estimate Process.*

[a] Principle player

11. Establish methods to identify targets during CAS operations.

Key Players:

- · Bn/TF Fire Support Officer (FSO)[a]
- · Air Liaison Officer (ALO)
- · CAS pilots
- · Enlisted Terminal Attack Controller (ETAC)

- · Subordinate commanders
- · Laser designator teams
- · Bn/TF commander

Conditions: CAS mission has been approved, either preplanned or immediate. The target or target area is observable by the unit in contact.

Actions: The actions related to target identification are described below. (Ground laser teams do not identify targets; they only mark them. Marking actions are described in Task X.)

1. FSO assigns primary and alternate methods for identifying targets as soon as practical. Selection is based on availability and appropriateness. Identification methods include

    (a) laser designation by helicopters, or fixed wing aircraft;
    (b) smoke rockets from aircraft;
    (c) indirect fire munitions, such as smoke white phosphorus, flare, or high-explosive rounds;
    (d) direct fire munitions, particularly tracer rounds from individual and crew-served weapons;
    (e) verbal description of target and/or talking pilot onto target; and
    (f) visual identification by pilots.

2. FSO designates primary and backup personnel to perform each selected method of target identification.

3. ALO relays primary and alternate methods of target identification to the CAS pilots.

Behavioral Outcome or Product: The methods for marking targets are relayed to the pilots. Primary methods are employed during the CAS attack, with alternate means used if the primary method cannot be executed.

Reference:

- · Army FM 90-28 (USAF TACP 50-45), *Tactical Air Planning and Employment in Support of Ground Operations.*

[a] Principle player

12. Establish methods to identify friendly troops during CAS operations.

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Air Liaison Officer (ALO)
- Bn/TF Staff Operations Officer (S-3)
- Bn/TF commander
- Subordinate commanders
- CAS pilots

Conditions: CAS missions have been approved, either on-call or immediate. Ground troops may be in close proximity to the targets.

Actions:

1. The FSO establishes recognition symbols and markings observable from the air and consistent with operational security (OPSEC) procedures. Possible methods include

    (a) mirror flashes,
    (b) marker panels,
    (c) smoke grenades,
    (d) infrared and thermal sources, and
    (e) references to direction/distance from terrain features, target, or marking rounds.

2. FSO informs units in contact exactly when to mark positions, and what means to mark.

3. Battalion maintains precise front line trace and unit locations including those of scouts and observation points (OPs).

4. ALO relays information regarding disposition of friendly elements and means of identification/marking to the pilots.

5. Pilots verify friendly locations just prior to the strike.

Behavioral Outcome or Product: Methods for identifying friendly troops are established and communicated to players. No fratricide of friendly troops occurs during mission.

Reference:

- Army FM 90-28 (USAF TACP 50-45), *Tactical Air Planning and Employment in Support of Ground Operations.*

[a] Principle player

13. Conduct a fire support/CAS rehearsal.

<u>Key Players</u>:

- Fire Support Officer (FSO)[a]
- Bn/TF Staff Operations Officer (S-3)[a]
- Fire Support Element (FSE)
- Air Liaison Officer (ALO)[a]

- Bn/TF commander
- Subordinate commanders
- Laser designator team

<u>Conditions</u>: The unit has approved preplanned or preplanned on-call CAS. There is sufficient time before execution to conduct a rehearsal.

<u>Actions</u>: The FSO conducts the fire support rehearsal with the commander or the S-3 evaluating the results.

1. If there is enough time, a full rehearsal is conducted involving all participants who will be responsible for controlling the execution of the fire support. It is based on implementing and wargaming the fire support plan and coordinated with rehearsal of the operational plan (maneuver).

2. If there is not enough time to conduct a full rehearsal, the fire support plan is wargamed or MAPEXed with the S-3, FSO, and ALO. Responsibilities and communication channels are designated.

3. For either a full or limited rehearsal, the following actions are performed by rehearsal participants:

   (a) Insure operational communication/data links are consistent with the operational security (OPSEC) plan.

   (b) Establish specific individual and organizational responsibilities and designate backup personnel.

   (c) Establish time lines and trigger events.

   (d) Identify contingencies.

   (e) Modify the fire support plan and matrices on the basis of findings.

<u>Behavioral Outcome or Product</u>: Results of CAS rehearsal are provided as part of the fire support briefback to the Bn/TF Commander/S-3. Rehearsal eventually results in modifications to the fire support plan.

<u>Reference</u>:

- Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy)*.

[a] Principle player

14. Pass preplanned CAS targets to higher headquarters.

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Bde Fire Support Element (FSE)[b]
- Bn/TF Staff Operations Officer (S-3)

- Air Liaison Officer (ALO)
- Bn/TF Commander

Conditions: The Bn/TF Commander has approved preplanned CAS targets specified in the Fire Support Plan.

Actions: The Bn/TF FSO passes preplanned targets to Bde and higher FSEs. The message goes up through the fire support chain to the Battlefield Coordination Element (BCE).

Behavioral Outcome or Product: Immediate product is a written order listing all preplanned scheduled targets. These same targets would also be documented in the OPORD. Preplanned on-call missions have expected time of use, numbers and munitions configurations.

Reference:

- Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy)*

[a] Principle player
[b] O/C represents Brigade personnel

15. Prioritize all CAS requests from subordinate commanders.

Key Players:

- Bn/TF Fire Support Officer (FSO)[a]
- Air Liaison Officer (ALO)
- Subordinate commanders

Conditions: Subordinate elements (company/team commanders and scout platoon leaders) have requested CAS missions or have identified fire support requirements that could be met by CAS. Requests may be preplanned or against targets of opportunity. Bn/TF commander has specified high value targets (HVT) and high payoff targets (HPT).

Actions: In considering all fire support requests, the FSO and ALO

1. If request is for immediate CAS, the Bn/TF S-3 processes it through the TOC and coordinates it with FSO, ALO, and the Bn/TF commander.

2. In considering all fire support requests, the FSO and ALO perform the following actions:

    a. compare the requests with the Bn/TF Commander's concept of the operation and his operational plan, and designated HVT/HPT;

    b. consider the means available to attack the target: indirect, organic indirect, CAS, and Army Aviation;

    c. consider the following factors: target type, CAS availabilities, time, enemy air defenses, target acquisition limitations and capabilities, and target area weather;

    d. establish priorities and make recommendations to the commander.

3. The Bn/TF commander makes the final decision whether or not to approve the request for CAS.

Behavioral Outcome or Product: For preplanned scheduled targets, approved targets (and their priorities) appear in the OPORD. For immediate and preplanned on-call targets, CAS target approval and priority is communicated by radio.

Reference:

- Army FM 6-20-40, *Fire Support for Brigade Operations (Heavy)*.

[a] Principle player

16. Pass immediate targets and on-call target updates to higher headquarters.

Key Players:

- Air Liaison Officer (ALO)[a]
- Bn/TF Commander[a]
- Bn/TF Staff Operations Officer (S-3)

- Bn/TF Fire Support Officer (FSO)
- Bde Fire Support Element (FSE)[b]
- ASOC[b]

Conditions: On the basis of appropriate targeting data, the Bn/TF commander in consultation with Bn/TF staff has decided that CAS is needed immediately to assist in the accomplishment of the mission.

Actions: At the direction of the Bn/TF Commander, the ALO passes immediate target requests and on-call target updates over the "Air Request Net" directly to the Air Support Operations Center (ASOC).

Behavioral Outcome or Product: The ASOC receives from the ALO a request for an immediate target or an update to an on-call target.

Reference:

· Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy).*

[a] Principle player
[b] O/C represents Brigade personnel and ASOC.

17. Provide initial brief to pilots and controllers.

Key Players:

- Ground Liaison Officer (GLO)[a][b]
- CAS pilots[a]
- Tactical Air Control - Airborne (TAC-A)[a]
- Air Liaison Officer (ALO)[a]

Conditions: Bn/TF OPORD has been completed, including enemy situation, target information, and terrain analysis.   This information has been provided to GLO in pilot's wing.

Actions:

1. Prior to take-off, GLO briefs CAS pilots on ground commander's intent and concept of operation, enemy situation, target, terrain analysis, and the commander's priority intelligence requirements (PIR).

2. ALO provides the same information to the airborne TAC-A by radio.

3. CAS pilots seek out PIR information during their mission and report to ALO, who in turn relays information to Bn/TF commander.

Behavioral Outcome or Product: Two immediate outcomes are (a) the GLO's oral briefing to pilots prior to take-off, and (b) the ALO's radio communication with the TAC-A. The eventual desired outcome is the pilots' understanding of the mission, which may be determined by a short briefback. Another possible outcome is the CAS pilot reports regarding the commander's PIR.

Reference:

- Army FM 90-28 (USAF TACP 50-45), *Tactical Air Planning and Employment in Support of Ground Operations.*

[a] Principle player
[b] MDT2 does not use the GLO position. In MDT2, the prebrief to the pilots is written information.

18. Update airborne pilots as necessary.

Key Players:

- Bn/TF Commander and Staff[a]
- Tactical Air Control - Airborne (TAC-A)[a]
- Enlisted Terminal Attack Controller (ETAC)[a] · CAS pilots
- Air Liaison Officer (ALO)[a]
- Fire Support Officer (FSO)

Conditions: Subordinate elements have reported changes in the tactical situation since the initial brief. Examples of tactical changes include movement of an enemy target, movement in the location of friendly forces, or a change in the status of enemy air defense artillery.

Actions:

1. The Bn/TF commander and his staff (including FSO) understand the input requirements for mission execution, and recognize changing tactical situations that impact on the mission.

2. The commander and/or staff normally direct the ALO to relay information to CAS pilots through the TAC-A. If close to air attack, this information may be communicated directly from the attack controller (ALO or ETAC) to the pilots.

Behavioral Outcome or Product: The pilots receive timely communication that accurately describes the changes in the tactical situation and its impact on the CAS mission.

Reference:

- Army FM 90-28 (USAF TACP 50-45), *Tactical Air Planning and Employment in Support of Ground Operations.*

[a] Principle player

19. Perform communications check among all fire support and CAS participants.

Key Personnel:

- Bn/TF Fire Support Officer (FSO)[a]
- Enlisted Terminal Attack Controller (ETAC)
- Tactical Air Control-Airborne (TAC-A)
- Laser designator team
- Air Liaison Officer (ALO)[a]
- Bn/TF Commander
- CAS pilots

Conditions: The Bn/TF commander has directed the FSO to conduct a communication check with all players in the fire support/CAS net at a designated time. Radio silence conditions may or may not be in effect.

Actions:

1. FSO conducts a check of primary and backup communications with supporting artillery unit, Bn/TF mortar platoon, FISTs, and ALO.

2. ALO conducts communication check with ETAC, TAC-A, laser designator teams, and pilots upon arrival in sector.

3. Under conditions of radio silence, all participants talk through their commo procedures and wargame possible actions should breaks in communication occur.

Behavioral Outcome or Product: Primary and back-up communications among CAS participants are established and operative.

Reference:

- Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy).*

[a] Principle player

20. Control CAS air attack.

<u>Key Players</u>:

- Air Liaison Officer (ALO)[a]   · Bn/TF Fire Support Officer (FSO)
- Tactical Air Control-Airborne (TAC-A)[a]   · CAS pilots
- Enlisted Terminal Attack Controller (ETAC)

<u>Conditions</u>: CAS missions has been approved and scheduled in to the Bn/TF sector. An forward air controller is airborne and on station.

<u>Actions</u>: In preparation for the attack, the actions are taken:

1. The ALO and TAC-A may confer to determine who will control the air attack. The final controller should be the one who is best able to control the air strike and observe its effects. This choice is likely to be the TAC-A, but the ALO or ETAC are both qualified air controllers who may be selected if they have a better line of sight.

2. The ALO identifies back-up elements (normally the FSO) in the event a qualified controller (i.e., the TAC-A, ALO, or ETAC) cannot control CAS aircraft. This step must be performed in case the communications between the aircraft and the Tactical Air Control Party (TACP) are disrupted.

3. The ALO insures (in conjunction with the FSO) that all primary and back-up elements have proper frequencies, call signs, correct CEOI, and are all operating in the secure/unsecured mode. Failure to do so may result in disrupted or ineffective communications.

4. The ALO insures that the TAC-A is on station and has communications with ground elements and the CAS aircraft. This step is necessary to determine whether or not the back-up controller must be used.

<u>Behavioral Outcome or Product</u>: ALO establishes communication with pilots and all elements involved in the CAS mission. The resulting communications between controller and pilot are accurate and timely.

<u>Reference</u>:

- Army FM 90-28 (USAF TACP 50-45). *Tactical Air Planning and Employment in Support of Ground Operations.*

[a] Principle player

21. Confirm status of friendly air defense.

<u>Key Personnel</u>:

- Bn/Bde Staff Ops Officers (S-3)[b]
- Air Liaison Officer (ALO)[a]
- Tactical Air Control-Airborne (TAC-A)

- Bn/Bde Fire Support Officers (FSO)[b]
- CAS pilots

<u>Conditions</u>: A CAS mission has been assigned to the Bn/TF sector.

<u>Actions</u>:

1. The Army Air Command and Control (A2C2) cell (i.e., the S-3 Air, the FSO, and the ALO) at the Bn/TF contacts their A2C2 counterparts at brigade or division.[b] This communication occurs just prior to CAS mission to confirm status of friendly air defense artillery (ADA) weapons.

2. Upon confirmation of status, the FSO or S-3 notifies ALO to relay information on friendly ADA to TAC-A.

3. ALO includes information concerning friendly ADA in initial brief to pilots, or as a remark in the 9-line brief to pilots.

<u>Behavioral Outcome or Product</u>: To avoid fratricide, appropriate yet minimal restrictions are placed on ADA fires. Pilots know friendly ADA status and take measures to avoid ADA fires.

<u>Reference</u>:

- Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy)*.

[a] Principle player
[b] O/C represents Brigade personnel

22. Arrive on station and establish initial communications.

Key Personnel:

- CAS pilots[a]
- Tactical Air Controller-Airborne (TAC-A)[a]
- Air Liaison Officer (ALO)[a]
- Bn/TF Fire Support Officer (FSO)[a]
- Laser designator teams[a]
- Bn/TF Commander

Conditions: Pilots are airborne at designated time with proper munitions loads.

Actions:

1. Upon entering the airspace controlled by the TAC-A, CAS pilots report to TAC-A or ALO their arrival on station, their weapons status, and their estimated time to reach the initial point (IP).

2. At the contact point (CP), the TAC-A or ALO give the pilots a CAS update (target description, friendly situation/update) and a 9-line J-FIRE brief. Throughout the CAS mission, TAC-A or ALO continuously updates pilots on any relevant changes in the mission, navigational data, enemy air defense threats, and a verbal picture of the target. The pilot replies.

3. Given authority by the Bn/TF commander, FSO grants final attack clearance to the pilot through the TAC-A or ALO.

4. Pilots announce time to target to the TAC-A or ALO who relays information to the FSO and other fire support personnel (e.g., laser designator team, FIST).

5. Laser designator teams establish communications with pilots.

Behavioral Outcome or Product: All communications are established in preparation for CAS mission.

References:

- USAF TC 90-7 (TACP 50-22). *Tactical Air Control Party/Fire Support Team Close Air Support Operations.*

- Army FM 90-20 (TACP 50-28, FMFRP 2-72), *J-Fire Multi-Service Procedures for the Joint Application of Firepower.*

[a] Principle player

23. Synchronize CAS attack with other direct and indirect fires.

<u>Key Players</u>:

· Bn/TF Fire Support Officer (FSO)[a]   · Bn/TF Commander

<u>Conditions</u>: CAS aircraft are airborne and prepared to start mission.

<u>Actions</u>:

1. FSO directs time hacks to insure that suppression of enemy air defenses (SEAD) fire impacts 60 seconds prior to aircraft arrival in area of responsibility (AOR) and continues 60 seconds after their departure from AOR. Failure to do so could result in CAS aircraft receiving fire from enemy air defenses.

2. FSO directs time hacks to produce simultaneous effects of CAS with other fire support systems. Effects on enemy are greater when indirect fires are used simultaneously with CAS than when indirect fire and CAS are employed separately.

3. Through the FSO, Bn/TF commander synchronizes maneuver force attacks with the CAS attack. Simultaneous direct fire should increase the synergy of CAS and indirect fires even further.

<u>Behavioral Outcome or Product</u>: CAS aircraft are not hit by SEAD fire. Direct and indirect fires are coordinated with CAS attack to produce simultaneous effects.

<u>References</u>:

· Army FM 6-20-40. *Fire Support for Brigade Operations (Heavy).*

[a] Principle player

24. Conduct CAS attack.

Key Players:

- Tactical Air Controller-Airborne (TAC-A)[a]
- Enlisted Terminal Attack Controller (ETAC)[a]
- Bn/TF Commander[a]
- Air Liaison Officer (ALO)[a]
- CAS Pilots[a]
- Laser designator team

Conditions: CAS pilots are airborne, briefed, and authorized to conduct CAS mission during the day with unlimited visibility. The TAC-A has taken over as final controller or has passed control to qualified ground personnel (ALO or ETAC).

Actions:

1. To insure that pilots are oriented on the enemy and not on friendly forces, only the final controller authorizes weapons release. The controller uses either direct and indirect methods to authorize the release:
   (a) If the final controller can observe both the aircraft and target, he directly authorizes weapons release himself when he determines the aircraft is attacking the correct target.
   (b) If the controller cannot see both aircraft and target, he uses the indirect method wherein he relies on information from someone observing the target to issue authorization.

2. For laser designated target, pilots make the following call to the laser designator team:
   (a) "10 secs" (time until "laser on"),
   (b) "laser on,"
   (c) "spot," and
   (d) "terminate."

3. In response to pilot signals, laser designator illuminates the proper target at "laser on" and turns it off at "terminate."

4. For targets designated by other means (smoke, white phosphorus, etc.), the final controller describes where the target is in relation to marking rounds.

5. All personnel who are in a position to observe target effects report them up the ground and air chains.
6. The TAC-A evaluates target effects. If he determines that the commander's intent was not met, he recommends a target re-strike to the commander through the ALO. He also determines whether the same aircraft should be used for the re-strike.

7. If necessary, the Bn/TF commander authorizes a re-strike on the target.

Behavioral Output or Product: Aircraft destroys target without hitting friendly troops.

References:

- USAF TC 90-7 (TACP 50-22). *Tactical Air Control Party/Fire Support Team Close Air Support Operations.*
- USMC FM 5-41, *Close Air Support and Close-In Fire Support.*
- USAF Armstrong Laboratories Report, "F-16 Instructional Objectives and Performance Measures."
- Air Land Sea Application (ALSA) Center, Joint Publication 3-09.3, *Doctrine for Joint Fire Support.*

---

[a] Principle player

25. Return from and assess CAS mission.

- CAS pilots[a]
- Fire Support Officer (FSO)[a]
- Tactical Air Control-Airborne (TAC-A)[a]

- Ground Liaison Officer (GLO)[a][b]
- Air Liaison Officer (ALO)[a]

Conditions: CAS attack has been completed.

Actions:

1. Pilots depart through proper airspace coordination area (ACA) and return to base.

2. Fire and air support personnel assess air losses and determine corrective actions.

3. Pilots report to TAC-A any intelligence requirements requested by the Bn/TF commander. TAC-A passes information to ALO, who in turn provides information to commander, FSO, S-2, and S-3. Also, pilots report intelligence to the GLO upon return to base.

4. GLO is present during pilot debrief and elicits pertinent information to assess mission success. GLO disseminates the information to the battlefield coordination element (BCE), which in turn passes it down the ground chain.

Behavioral Output or Product: Intelligence and battle damage assessment (BDA) information has been obtained from pilots and passed on to the appropriate recipients. If strike is assessed to be successful, the Army mission continues as planned. If not successful, the CAS mission is repeated.

References:

- Army FM 90-28 (USAF TACP 50-45). *Tactical Air Planning and Employment in Support of Ground Operations.*

- USAF Armstrong Laboratories Report, "F-16 Instructional Objectives and Performance Measures."

[a] Principle player
[b] MDT2 does not use the GLO position. In MDT2, the prebrief to the pilots is written information.

APPENDIX B

SCENARIOS

This appendix presents the types of scenarios and exercise support materials needed for MDT2 CAS training. This information provides the context or "story" for a combat operation and delineation of the forces involved. The details include possible defensive and offensive scenarios, maneuver, and fires for an armored battalion task force. The forces and actions were selected to ensure a range of missions that could emphasize CAS procedures. The appendix has the following parts:

POSSIBLE SCENARIO FOR MDT2

GENERAL SITUATION: (Today's Date: <u>Mayember 24, 1994</u>)

The country of *Qari* has completed the initial phase of an invasion of **Kaliforn**, an allied Middle East nation. In that phase, which began on <u>Mayember 1, 1994</u> , *Qarian* forces conducted a surprise attack against **Kaliforn**. This attack destroyed the majority of the **Kaliforn Air Force** on the ground and overran 3 lightly equipped **Kaliforn** border divisions in the **Irwinfort Province.** This province near the coast of the Pacten Ocean was claimed by *Qari* as a province that had been taken from them by the partitioning of the region by Britfren 75 years ago.

It initially appeared that the *Qari* strongman, *Raddam Inzein,* would be satisfied with his grab of this oil-rich province. However, **US intelligence sources** are now predicting a continuation of the attack to complete the takeover of **Kaliforn.** *Inzein* possesses a well-trained, modern, combat tested *army* that is equipped with modern *Soviet weapons.* His *air force* is also equipped with modern Soviet aircraft.

The **US** in response to a request by **Kaliforn** deployed forces on <u>Mayember 4, 1994</u> to assist in the defense of the country. Additionally, the neighboring countries of **Nevad** and **Ariz** have granted **basing rights** and unlimited use of their **air fields** to the **US**.
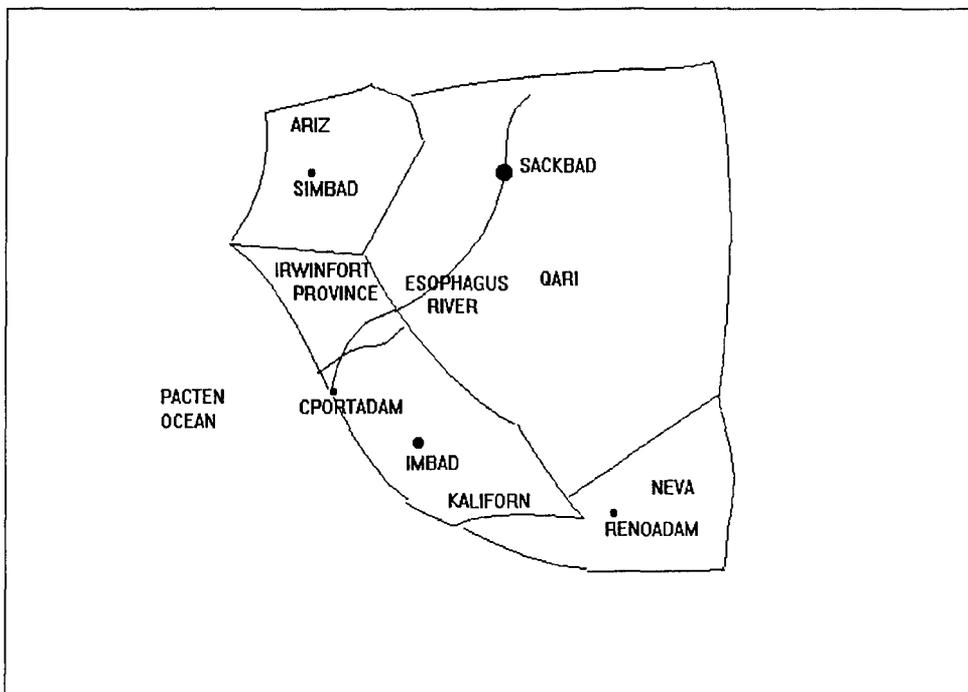
Qari Forces seem to have thinned their lines in the western region of **Irwinfort** and are massing for what appears to **intelligence agencies** to be an attack within <u>72 hours</u> to destroy or render ineffective the two defending **Kaliforn** corps. **Intelligence** information indicates that the *Qari commander* believes he can accomplish this prior to the arrival of **US forces** in sector.

Qari and **US** air forces have engaged in combat with each other for the past <u>18 days</u>. Local air superiority over the **Allied ground force** area of responsibility has been attained and most of the *Qari* sophisticated air defense systems have been destroyed. However, *Anti-Aircraft Artillery (AAA)*, in the form of *ZSU 23-4* and *man-packed heat seeking missile systems* still exist. To date, the only contact between **US** and *Qari* forces occurred as **US forces** overran or drove off forward *enemy* reconnaissance units as it moved into position. Additionally, **US helicopters** have conducted deep attacks into the *Qari* rear.

Allied ground forces consist of:

Two **Kaliforn** corps (each with two mechanized and one armor division),
10th US Corps (with two armored and one mechanized division),
5th Marine Expeditionary Force (MEF) (with two divisions).

Allied air forces consists of:

90th US Air Force,
MEF air wing,
A naval air wing from a carrier group.

ALLIED COMMAND STRUCTURE:

US Joint Force Commander (JFC)

The **King of Kaliforn** has placed the two **Kaliforn corps** under the **JFC**

Designated the commander of the **30th US Army** as **Joint Force Land Component Commander (JFLCC)**

Designated the commander of the **90th Air Force** as **Joint Force Air Component Commander (JFACC).**

JOINT FORCE CONCEPT OF OPERATIONS:

The **JFC** decided to conduct continuous **air and ground attacks** against *Qari forces* and *key installations* simultaneously throughout the theater of operations. The objective of these attacks is the destruction of *Qari* ground forces in **Kaliforn** and the neutralization of possible *reinforcement* units in *Qari*.

Additionally, these **attacks** will allow the *enemy no sanctuaries nor respite.* These **actions** will create the conditions necessary to accomplish the **National Command Authority's mission** regarding **Irwinfort Province,** destroy *Qari invasion forces,* and prevent future *Qari incursions.*

SOF operations and air operations in support of the **JFC's campaign** plan commenced <u>18 days</u> ago, as did **naval surface fires, long range artillery attacks and deep attacks by Army helicopters.** These operations were successful in blinding the *enemy's* ability to detect the movement of **Allied ground forces.**

During this time **Allied ground forces** moved into position to **attack** *Qari forces* as they were posturing for *their own* attack.

At <u>0605 yesterday morning,</u> the **1st and 4th Kaliforn Corps** conducted offensive operations along the axis of the expected *Qari* main attack. Although these **operations** did not produce a breakthrough, **they** inflicted heavy casualties and forced the *Qari* lead elements to ground and begin to establish hasty defenses. The objective of this **Allied spoiling attack** was to fix the *Qari attacking force* in place and disrupt *his* intended attack. **Reports** indicate that *Qari forces* were completely surprised and that *heavy armored forces* designated for the second echelon for the upcoming offensive had to be pushed forward under heavy **Allied air attacks** to establish defensive positions approximately 10 kilometers to the rear of the lead element.

At <u>0001 hours tomorrow,</u> **10th US Corps** and the **5th MEF** will attack in zone to penetrate *Qari defenses* and continue the attack into the rear flank of the *Qari* main attack force. The **JFC's** intent after a successful penetration of the *enemy defenses* is for **5th MEF** to continue **their** attack to destroy *enemy forces* in zone and for **10th Corps** to attack toward the *Qari* border to destroy the *Qari* main attack forces, disrupt *his logistical rear,* cut off *lines of communications,* and prevent the escape of *Qari forces.* **Allied** penetration of the *Qari* defense should be completed <u>NLT 1245 hours.</u>
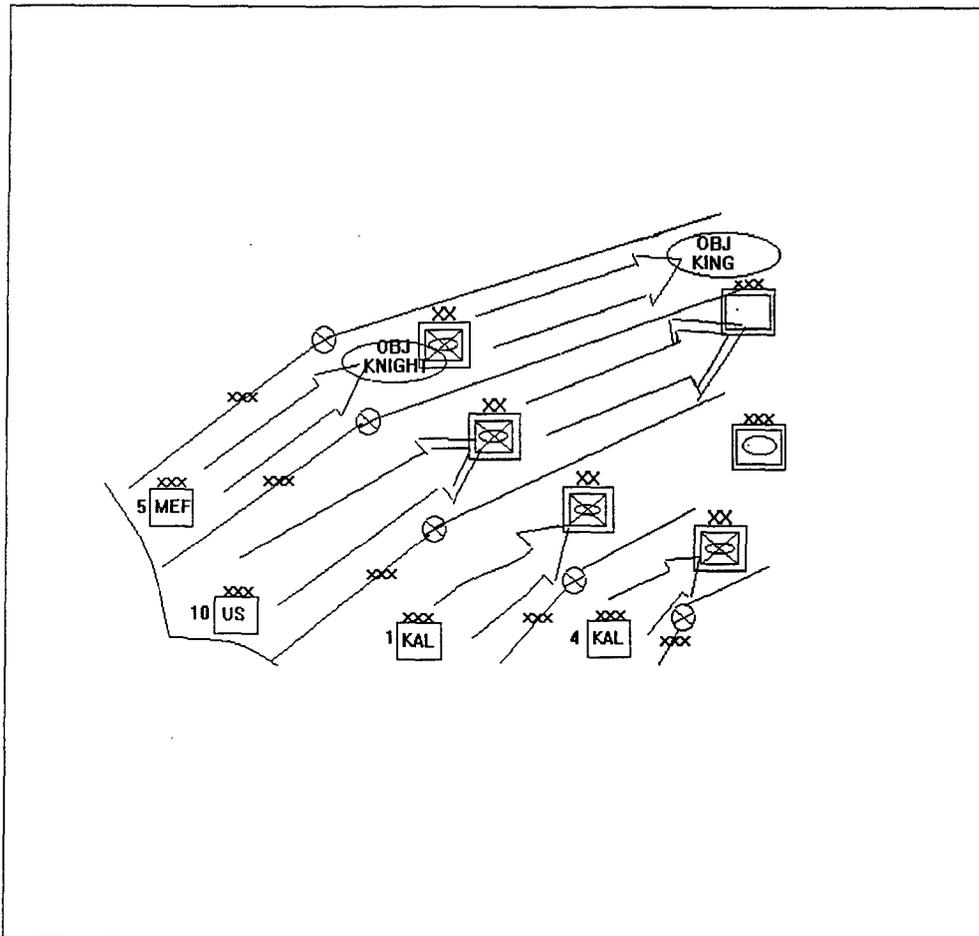
The **JFC's** target priorities prepared by the **Joint Targeting Coordination Board** are the following *Qari* assets:

> *(1) Air and air defense forces*
> *(2) Command, control, communications and intelligence assets*
> *(3) Artillery*
> *(4) Armored formations*
> *(5) Logistics and transportation assets*
> *(6) Fuel and munitions field storage sites/columns*

The **JFC's** apportionment of air assets for today was

> 35% counterair
> 35% air interdiction
> 30% close air support

JFC also stated that 75% of the CAS sorties were to be available from 1200-2000 hours today. The JFACC has informed the JFLCC that the approximate allocation of CAS for today is 500 sorties. The JFLCC has issued his guidance for the allocation of CAS as follows:

1st Kaliforn Corps	75 sorties
4th Kaliforn Corps	75 sorties
10th US Corps	200 sorties
5th MEF	150 sorties

The JFLCC placed the following elements of the 10th Corps under the operational control (OPCON) of the 5th MEF for the duration of the campaign:

1st Brigade 23 Armored Division
- 2 Armor Battalions
  - 1-1 Armor Bn
  - 1-2 Armor Bn
- Mechanized Battalion
  - 1-3 Mechanized Bn
- Direct support artillery battalion[155SP]
- Forward support battalion
- Engineer company
- ADA assets

222d FA Brigade
- MLRS/ATACMS battalion
- Two 155SP battalions

1-23 Attack Helicopter Battalion (Apache)

90th AIR FORCE OPERATIONS CENTER (AOC):

Based on the number of CAS sorties and the concept of operation of 10th Corps and 5th MEF, the AOC directed that four TAC-A aircraft would be available to direct CAS from 0600-2000 hours today, two in the 10th Corps AOR and two in 5th MEF AOR.

5th MEF CONCEPT OF THE OPERATION:

The 5th MEF will attack in zone at 0001 hours tomorrow with the 6th Marine Division (MarDiv) followed by the 7th MarDiv with 1st Bde 23 AR OPCON. 222nd FA and the 7th MarDiv artillery will be positioned well forward with the artillery from 6th MarDiv.

6th MarDiv mission:

> Pass through **7th MarDiv**,
> Attack and penetrate the *Qari* main defensive positions,
> Destroy the *551st and 552d Qari Infantry Brigades* occupying these
> positions, Assist the passage of the **7th MarDiv** through the penetration.

Upon passage of the **7th MarDiv, 6th MarDiv** is to follow and support **7th MarDiv,** leaving enough forces in sector to ensure the destruction of any remaining *Qari forces.*

6th MarDiv will attack at <u>0001 hours</u>, successfully penetrate *enemy* positions and pass the lead elements of the **7th MarDiv** <u>NLT 1220 hours</u>.

7th MarDiv mission:

> Pass through the **6th MarDiv,**
> Attack and destroy the *555th Qari Armored Brigade,* the reserve
> of the *55th Qari Armored Division,*
> Enemy forces company size and smaller that can be bypassed
> will be left for the following **division.**

The intent of the **commander, 5th MEF**, is to destroy the *555th Ar Bde* and push **7th MarDiv** into the rear of the *Qari* main attack forces thereby cutting *their LOCs* and preventing *their escape.*
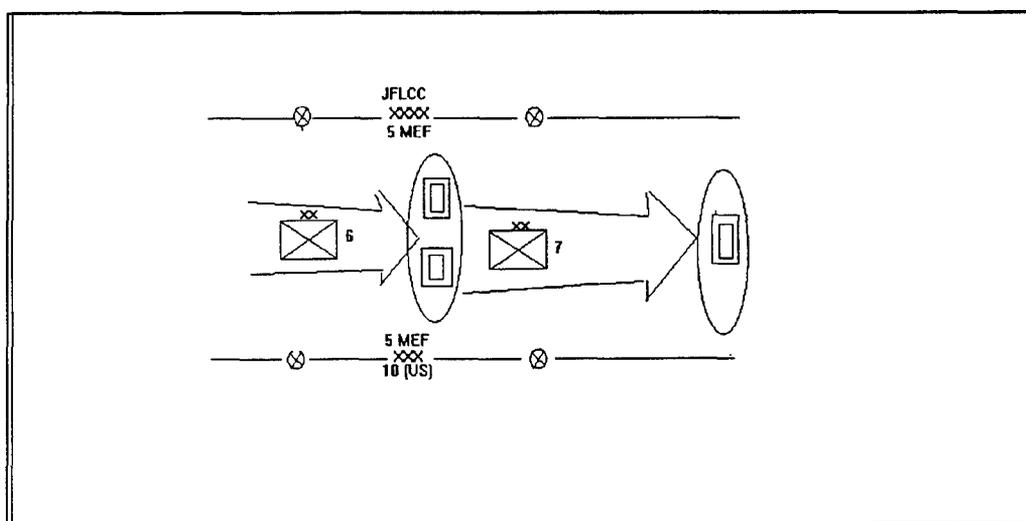
Upon passage of lead elements of **7th MarDiv** at <u>1200 hours</u>, **MULE** teams from **6th MarDiv** will be attached to **7th MarDiv**.

Commander, 5th MEF, issued the following guidance for **CAS** missions for the operation.

Target priorities for **CAS** :

> **6th MarDiv-** *enemy artillery*
> *enemy armor formations*
>
> **7th MarDiv-** *enemy armor formations*
> *enemy artillery*

CAS sorties to support this operation:

6th MarDiv-	24 pre-planned	0600-1200 hrs
7th MarDiv-	102 on-call	1200-2000 hrs
5th MEF	24 on-call	0600-2000 hrs

7TH MARDIV CONCEPT OF THE OPERATION:

7th MarDiv will

> Follow **6th MarDiv** in their attack which will commence at <u>0001 hrs tomorrow</u>.
> Pass through **6th MarDiv,**
> Continue the attack to **OBJ KNIGHT**

7th MarDiv scheme of maneuver:

> **8th Bde** conducts the supporting attack on the left,
> **1st Bde 23d AR** conducts the main attack on the right,
> **9th Bde** follows **1st Bde 23 AR** as the reserve.

The intent of the **7th MarDiv** commander is for **1st Bde 23 AR** to quickly pass through the **6th MarDiv** and to conduct a movement to contact toward **OBJ KNIGHT**. **9th Bde** is to follow and support **1st Bde 23 AR** and to be prepared to destroy any by-passed *enemy forces.*

JFLCC
XXXX
5 MEF

8

8
X
1/23

9

1
23xx

5 MEF
XXX
10 (US)
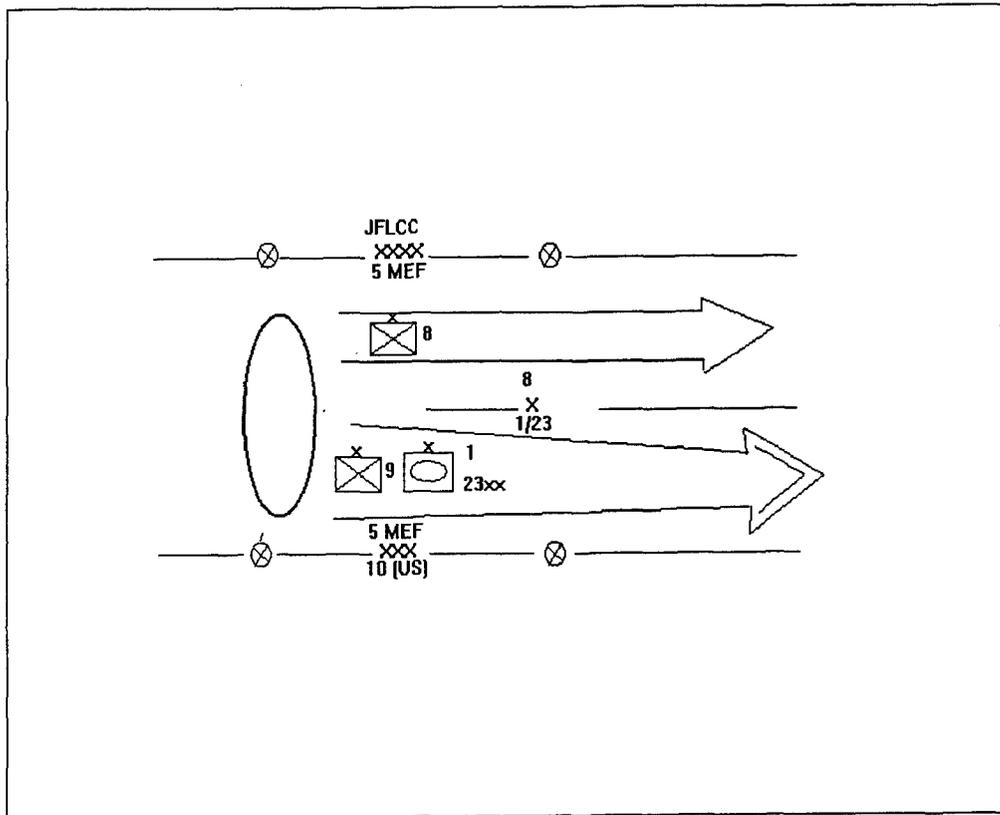
Commander, 7th MarDiv issued the following guidance for **CAS** support:

CAS priorities-   *enemy armor formations*
                        enemy artillery

CAS allocations:

8th Bde-	46 on-call	1200-2000 hrs
1st Bde 23 AR	46 on-call	1200-2000 hrs
9th Bde	10 on-call	1200-2000 hrs

DEFENSIVE OPERATIONS

(Suggested Example)

BRIGADE

(Suggested Example)

BRIGADE CONCEPT OF THE OPERATION (DEFENSE)

It is now <u>1300 hours</u>. The Brigade Commander has his battalion commanders and staff at the Brigade TOC for issuance of the OPORD.

Commander's Planning Guidance

OK gents, listen up. The situation has changed a little. We are going to have to go on the defensive for the time being; it seems as if the politicians are going to try to work out a truce. We had Inzein on the run and his army was down on its knees, but now we must wait it out. I don't trust that so-called military leader we've been kicking around the desert to abide by any truce, so we will be prepared. The Qari army is back in its own country now but intelligence sources believe that if he attacks again into Kaliforn, it will be in this sector. In any case I want us to be prepared.

I want to defend forward initially, establishing a defense that will force the Qari commander into a position where he will lose his ability to maneuver and then we will finish his annihilation completely. I expect the Red Pass approach to be his main approach and then I expect him to try to shoot through the Whale Gap and attempt to get to the rear. We will develop our defense to cause him to have to attack through the Valley of Death. So focus your defenses with that in mind. I want to fight the deep battle, with the limited assets that I have, against his first echelon in EA COBRA and EA PENGUIN using Artillery and CAS. We will do the same to his 2d Echelon in these same EAs.

Don't worry about the Whale Gap. The Marine Battalion to our south is establishing a strongpoint there which will also canalize the threat into our EAs.

TF 1-1 Armor you are our main effort. Start destroying well forward, and force him to enter our engagement areas. I want complete destruction of his 1st Echelon forward of PL CATWOMAN. TF 1-1 don't allow him to penetrate PL CATWOMAN. I don't need bad guys in the rear. As you begin developing your defensive plan, you need to consider integrating CAS and artillery in your fire plans especially in the EAs.

We will fight the remainder of the 2d Echelon from BPs located along PL BATMAN. Be prepared to move to these BPs as we are hitting the threat with CAS and artillery in EAs PENGUIN and JOKER.

TF 1-3 Mech, you are the key to this defense. I want you to establish your defense in such a manner to force the threat to stay south of the Tieforts. This will force the Qari commander to come down the Valley of Death and hit the EAs prepared by TF 1-1.

B-12

T-F 1-2 -- Armor you are the brigade reserve. You are to establish your initial defense in BP VARGAS. I want you to be prepared to attack through TF 1-1 to restore PL CATWOMAN and also to be prepared to move to BP WANDA to stop any breakthrough of TF 1-3 Mech. Also be prepared to react to any level II and III threats in the brigade and division rear areas.

OK Gents, we probably have 72 hours to prepare for this defense. That may seem like a lot of time but it isn't. We have a lot of work to do, who knows what is in Inzeim's little brain. Prioritize your work, and commanders I want a backbrief in 12 hours at my TAC.

EA
COBRA

EA
PENGUIN

EA
BAT

EA
JOKER

PL

PL

PL

SP

TF 1-3

TF 1-1

B

M

A

C

1/23

TASK FORCE
DEFENSE
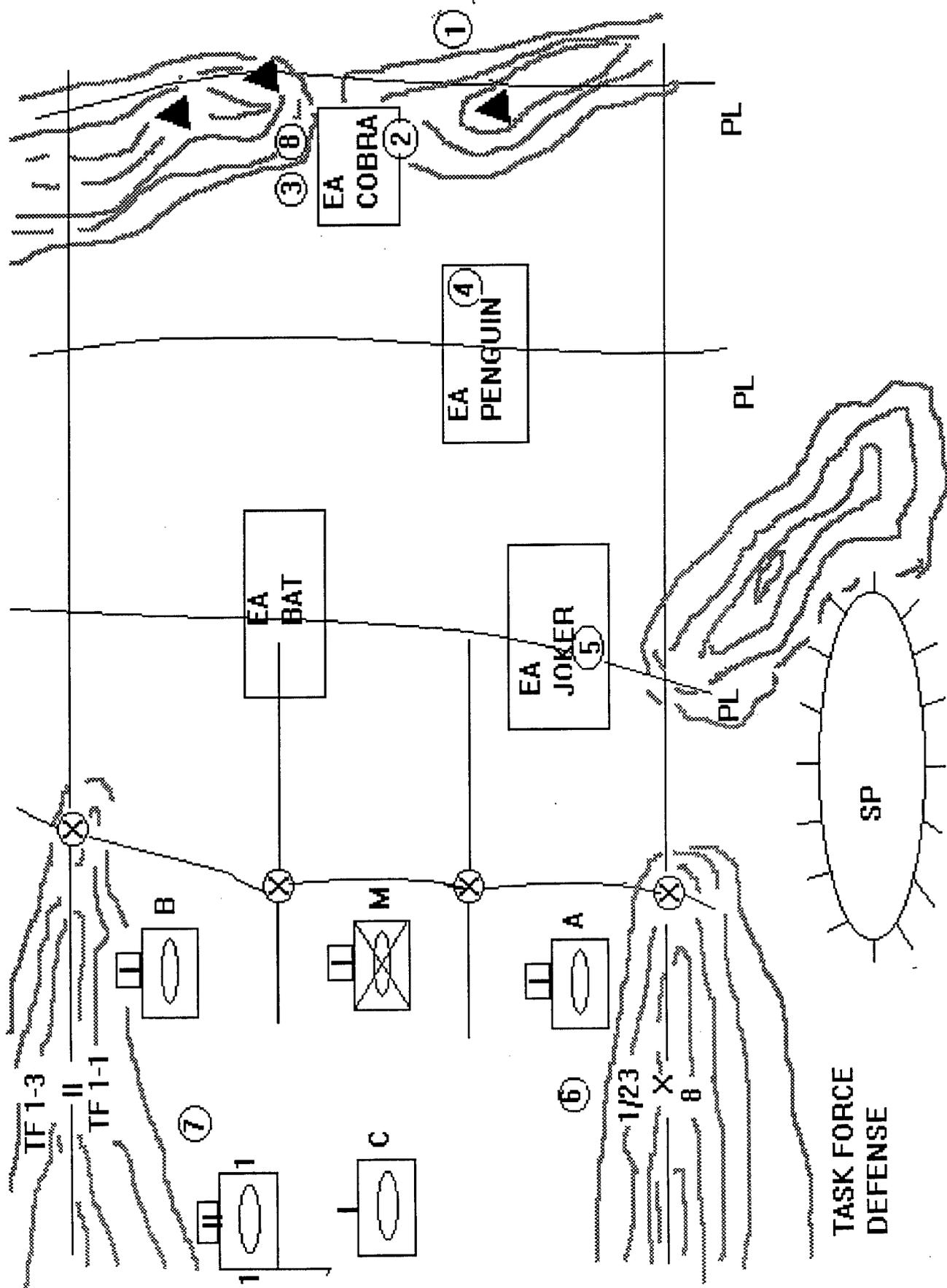
Brigade OPORD (Defense)
with control measure coordinates

(Suggested Example)

___ May 1994
NJ_____

<div style="text-align: right">

Copy No.--- of---copies
HQ, 1st Bde. 23d Ar Div
Middesert, Kaliforn
--0700S May, 1994
</div>

OPORD 01-02

REFERENCE: Maps, 1:50,000 Fort Irwin Special (DARPA)

Time zone used throughput the order: SIERRA

TASK ORGANIZATION:

TF 1-1 AR	BDE TROOPS
1-1 AR (-) (M1)	1-50 FA (155, SP) (DS)
D/1-3 Mech (M2)	B/23 EN Bn
1/B/23 Engr	A/1/440 ADA
C/4/B/1/440 ADA (S)	B/23d MI (GSR)
2/1/B/23d MI (GSR)	*****

<pre>
TF 1-2 AR
        1-2 AR (-) (M1)
        C/1-3 Mech (M2)
        2/B/23d Engr
        *****
        *****
</pre>

BDE TRAINS
1st FSB

<pre>
TF 1-3 Mech
        1-3 MECH (-) (M2)
        D/1-1 AR (M1)
        D/1-2 AR (M1)
        *****
        *****
</pre>

1.   SITUATION.

    A.   Enemy Forces (Annex A, Intelligence Annex)

        Overview. The Qari Army has been pushed out of Kaliforn, and is currently In
IM imposed holding areas in their homeland awaiting the outcome of ongoing peace talks. Their
strength is estimated at 65-70%. They have no capability to use chemical or nuclear weapons.

B.   Friendly Forces:

(1)   7th MarDiv conducts a defense in sector NLT __ 0600S May 1994 to defeat and destroy the 55th Qari Armor Division and prevent a takeover of the Irwinfort Province. The division commander's intent is to defend with 3 brigades forward. He will accept the risk of no reserve in order to place all assets against a weakened enemy. Division will initially concentrate the deep battle on finding, slowing and attriting the 2d echelon of the 55th Qari Ar Div. Divisions main effort will be in the center keyed on the defense of 1st Bde, 23d AD. MBA brigades will defend along PL CATWOMAN and not allow a penetration of this phase line. The division commander wants to totally destroy the enemy forward of PL CATWOMAN.

(2)   9th Brigade defends in sector to the north from NK_____ to NK_____ to destroy forces in sector.

(3)   8th Brigade defends in sector to the south from NJ_____ to NJ_____.

(4)   3d Bn, 8th Marine will establish a strongpoint south of the "Whale Gap" from NJ_____ to NJ_____.

(5)   1st Bn, 23 Avn Bde will be the division reserve, on order will attack enemy forces in EA COBRA.

90th Air Force conducts air operations in support of 7th MarDiv. Provides the division with 80 CAS sorties.

C.   Attachments and Detachments
                See Task Organization

2.   MISSION. 1st Brigade defends in sector NLT __ 0001May 1994 from NJ _____ to NK_____ to destroy the 55th QAD.

3.   EXECUTION

Commander's intent: I want to destroy the 55th Qari Ar Div east of PL CATWOMAN to prevent any further military action in Kaliforn. We will defend in sector along PL CATWOMAN destroying the remnants of the 55th Ar Div. In the north we will shape the battlefield to force the enemy into the center sector where the heavy forces of the Bde can be brought to bear on him for final destruction. I plan to use all our assets - direct, indirect fire and CAS to complete the destruction.

A.   Concept of the Operation (Annex__, Operations Overlay)

      1st Brigade will defend in sector with TF 1-3 Mech in the north, TF 1-1 AR in the south and TF 1-2 AR as the brigade reserve. TF 1-3 Mech will shape its defense along PL CATWOMAN to force the enemy into the southern sector of TF 1-1 AR. TF 1-1 AR will defend along PL CATWOMAN orienting their defense on EAs PENGUIN, JOKER and BAT to destroy all enemy forces forward of PL CATWOMAN. TF 1-2 AR is the brigade reserve and will be prepared to reinforce either TF or conduct a counterattack to restore PL CATWOMAN.

      (1)   Scheme of maneuver

      1st brigade will conduct a deep battle with CAS and FA into EA COBRA and EA PENGUIN. TF 1-3 Mech will conduct a defense in sector forcing the enemy forces into the TF 1-1 AR zone. TF 1-1 AR will conduct a defense in sector and destroy the enemy with direct fire, FA and CAS in EA JOKER and EA BAT. TF 1-3 AR is the reserve and will occupy BP 1. TF 1-3 AR is to be prepared to conduct offensive operations in either forward TF sector to destroy any enemy forces that may break through or to restore PL CATWOMAN.

      (2)   Fires: (Annex F, fire support overlay)

            a.   Commander's intent for fire support: I want to suppress enemy forces with indirect fire to slow his advance and disrupt his C2. I want to use CAS to destroy his tanks and recon elements.

            b.   Priority of fires. TF 1-1 AR, TF 1-3 Mech, TF 1-2 AR in order.

            c.   CAS: TF 1-1 AR o/o TF 1-3 Mech.

            d.   Restrictions: no arty fires east of PL BUNNY.

      (3)   Intelligence/Electronic warfare: N/A

      (4)   Obstacles, Mines and Fortifications: (Annex C, Obstacle overlay)

            a.   Priority of engineer effort is survivability, countermobility and mobility. Priority of work is EA JOKER, then EA BAT, then EA PENGUIN.

            b.   FASCAM only on bde approval. TF plan FASCAM as allocated.
                 TF 1-3 Mech: 2
                 TF 1-1AR : 2
                 Bde control: 3.

            c.   Counterattack routes are obstacle free zones.

      (5)   Deception: TBP

B.   Tasks to maneuver units.

(1)   TF 1-1 AR:

    a.   Defend in sector from NJ 445980 to NK 4700015.

    b.   Defend along PL CATWOMAN, allow no penetration of CATWOMAN.

    c.   Be prepared to defend BP VARGAS

    d.   Observe NAI 4

    e.   Establish OPs along PL Bunny, orient on Red Pass, establish OP   and Mule team at NK 56950265.

(2)   TF 1-2 Ar:**
****
****
***.

(3)   TF 1-3 Mech ***
****
****
***.

C.   TASKS TO COMBAT SUPPORT UNITS.

(1)   ALO

    a.   General:

        1. 1st Bde allocated 30 sorties.
        2. Priority of employment to tanks, recon elements, artillery and C2.

    b.   Allocation for planning sources:
        TF 1-1 AR : 13,
        TF 1-3 Mech: 13,
        Bde control: 4.

    c.   BAI controlled by MEF.

(2) 1-50 FA

    <u>a</u>.   General:

        <u>1</u>.   Priority of GS .....

        <u>2</u>.   Counterfire priorities: ....

        <u>3</u>.   COPPERHEAD priorities: Armor concentrations.

    b.   Priority target allocation:

TF 1-1 AR - 2
TF 1-2 AR - 1

    c.   Fire Support Coordinating Instructions:

        <u>1</u>.   7th MarDiv CFL is PL BUNNY effective __0100 May 1994.

        <u>2</u>.   Authority to emplace short term FASCAM retained at brigade.

    d.   Organization for combat:

1-50 FA (155, SP) DS to 1st Bde
****
****
****

(3)   B/23 Engr Bn

    a.   Priority of support to TF 1-1 AR and obstacles in EA JOKER o/o TF 1-3 Mech.

    b.   Priority of engineer missions: survivability, countermobility and mobility.

    c.   Organization for combat: task organization.

(4)   A/1-440 ADA Bn (V/S)

    a.   Priority of protection to maneuver units, main CP, BSA.

    b.   ******

(5)   B/23 MI Bn ******

(6)   ***

(7)   ***

D.   COORDINATING INSTRUCTIONS.

(1)   PIR:

    a. Identify recon elements.

    b. Identify lead armor formations.

    c. ******

(2)   MOPP: MOPP level 0 in effect.

(3)   Troop Safety *****

(4)   ADA weapon control status is TIGHT; ADA defense warning is YELLOW.

(5)   All TF/Bns be prepared to implement SEAD for friendly air missions.

(6)   Bde rehearsal at Bde TAC NK_____ at __1500 May 1994.

(7)   Plan down pilot pickup points.

4.   SERVICE SUPPORT: (Annex H, CSS Overlay)

    a.   General ******

    b.   Material and Services ******

5.   COMMAND AND CONTROL

    A.   Command

(1)   Succession of Command: Bde XO, Cdr TF 1-1, Cdr TF 1-2, Cdr TF 1-3, Bde S-3 in order.

(2)   Bde TOC (NK _____)

(3)   Bde TAC (NK_____)

(4)   Alternate TOC is Bde TAC, 1-50 FA TOC in order.

    B.   Signal

(1)   SOI index 13-7 in effect

B-22

    (2)   Radio minimize until enemy contact   .

    (3)   IFF mode 3; IFF mode 4 IAW Code Book # 1A.

ACKNOWLEDGE:

                                     HARDCORE
                                     COL

OFFICIAL:

PUSHY
S-3

ANNEXES: A - Intelligence (TBP)
                B - MCCO (TBP)
                C - Enemy Ave of Approach (TBP)
                D - DST Overlay
                E - Operations Overlay
                F - Fire Support Overlay
                G - Obstacles Overlay
                H - CSS Overlay - (TBP)
                I - Control Measure Coordinates
The following matrices are included in this OPORD:

                Synchronization Matrix
                Execution Matrix
DISTRIBUTION: A
                Cdr, 7TH MarDiv
                Cdr, 8th Marine Bde
                Cdr, 9th Marine Bde
                Cdr, DIVARTY
                Cdr, 1/23 Attack Helicopter Bn
ANNEX I - CONTROL MEASURE COORDINATES

ANNEX A (INTELLIGENCE) to OPORD No. 01-02
Reference: Maps 1:50,000 Fort Irwin Special (DARPA); Situation Template (UNCLASS).

Time zone used throughout the order: SIERRA

1. SUMMARY OF ENEMY SITUATION: Over the past 48 hours Qari violations of the Kaliforn frontier have increased as both ground and air reconnaissance patrols have probed friendly forward defenses. National means indicate that a Qari Armored Division (55th QAD) is moving into assembly areas near the Qari-Kaliforn border. The QAD will probably attack across the Qari-Kaliforn border in the next 72 to 96 hours.

The Qari objectives are no longer centered on the destruction of the Kalifornian or U.S. forces in sector, but are directed toward the capture of political and economic objectives (the capital of Kaliforn"s Irwinfort Province and the surrounding oil fields). The Qari leaders believe that a successful attack and penetration of friendly forces will change the political will of the United States and force our abandonment of the King of Kaliforn. To quickly achieve a strategic penetration of Kaliforn, the QAD will probably mass its forces on one avenue of approach. The best routes to the provincial capital of Irwinfort and its oil fields are through the Valley of Death (NK3900) or through the Whale Gap (NJ4698) both via Red Pass (NK5503). A secondary approach is along the Central Corridor north of the Tiefort Mountains.

The QAD (based upon a Soviet tank division) is now at 60 to 75% strength and has been reorganized into two tank regiments (T72 equipped) and one MRR (BMP equipped). While some coordination will suffer because of the reorganization, Qari forces remain a well trained and disciplined force.

Qari forces are predominately equipped with Russian equipment and use Soviet Military Doctrine. The QAD has T-72 tanks, and BMPs. Tank and MR battalions can be expected to be well covered by air defense systems that include the SA 6, SA 9, SA 14, ZSU-23-4, ZSU-57-2, and possibly GEPARDs. Most of the Qari Air Force has been destroyed and it is not capable of achieving local air superiority over Kaliforn territory. However, attack helicopters can be expected along the QAD's main avenue of approach. Qari has Hinds and BO-105s with HOT AT missiles.

2. ESSENTIAL ELEMENTS OF INFORMATION

     a.   Location and direction of movement of Qad forward security element.

     b.   Location of QAD CPs.

     c.   Location, strength, and direction of movement of the QAD main body (first echelon).

     d.   Location, strength, and direction of movement of QAD second echelon.

3. INTELLIGENCE ACQUISITION TASKS

a. TF 1-1 AR:

(1) Report contact with Qari reconnaissance, forward security elements, and main body.

(2) Report locations of Qari C2 elements.

(3) Report use of enemy air assets.

(4) Report use of chemical weapons and/or locations of chemical delivery systems.

b. TF 1-2 AR:

c. TF 1-3 Mech:

4. MEASURES FOR HANDLING PERSONNEL, DOCUMENTS, AND MATERIAL
   No change from BDE SOP.

5. DOCUMENTS AND/OR EQUIPMENT REQUIRED

Transmit all requests for intelligence information to the BDE S2 Thru BN S2s.

6. COUNTERINTELLIGENCE
   No change from BDE SOP.

7. REPORTS AND DISTRIBUTION
   No change from BDE SOP.

<div align="center">
EAGLE
COL
</div>

NAME	COORDINATES	
PHASE LINE BUNNY	NK 559060*-NK 569030-NJ 579990	
PHASE LINE MARYANN	NK 530050-NK 516020-NJ 514980	Road
PHASE LINE BRENDA	NK 495050-NK 476010-NJ 466986*	
PHASE LINE CATWOMAN	NK 474048-NK 455016-NJ 446978	
PHASE LINE TRUDY	NK 400039-NK 400000-NJ 400978	
ENGAGEMENT AREA COBRA	Corners: NK 552022 NK 578038 NK 552038* NK 578022	BOX
ENGAGEMENT AREA PENGUIN	Corners: NK 506988 NK 538006* NK 506008 NJ 538988*	BOX
ENGAGEMENT AREA JOKER	Corners: NJ 462980 NJ 488998* NJ 462998 NJ 488980	BOX
ENGAGEMENT AREA BAT	Corners: NK 475020 NK 501037 NK 475037 NK 501020	BOX
TAI 4	NK 580035	

* Denotes change

BATTALION/TASK FORCE

(Suggested Example)

BATTALION/TASK FORCE CONCEPT OF THE OPERATION (DEFENSE)

It is now 1700 hours. The battalion commander has received the brigade operations order and is prepared to give his guidance. TF 1-1 AR has successfully secured its objective having completely routed the 555th Qari Ar Bde and has taken up hasty defensive positions.

COMMANDER'S PLANNING GUIDANCE

We really kicked his tail men, but now we have to wait on the politicians to do their thing. We can't let our guard down -- who knows what Inzein will do next. We are going to pull back to the west from this position and establish a defense. The brigade commander is going to defend with 2 task forces forward and 1 in depth to our rear. His plan is to destroy any enemy attack in a series of kill zones using all assets- direct fire, indirect fire, CAS and obstacles.

We will establish our defense in sector with 3 Co/Tms forward and a tank company in reserve. I want the scouts with the MULE Team in a series of OPs oriented on Red Pass. Have the Mule team in a position so that he can move quickly to previously reconned positions to lase on our TAIs and Checkpoints. Also, Scouts release the MULE team to TM A when you withdraw from the screen line at PL BRENDA. The counter recon fight is being handled by the Marine Reconnaissance Battalion to the east of Red Pass. Our defense will be aimed at causing the enemy to enter our Engagement Areas, then hitting him with every thing we have. We want to cause the Qari commander to lose his ability to maneuver. Task Force 1-3 Mech to our north will force the enemy to stay in our sector and a Marine battalion to our south will strongpoint the "Whale Gap" not allowing the enemy to go in that direction. The Brigade commander will take care of the deep battle, so all we have to worry about is the fight in our zone.

I want the three forward Co/Tms to orient your defenses on the engagement areas to your front. I want complete destruction of his forces forward of PL CATWOMAN; don't let him penetrate this phase line.

Co C, you are the reserve; be prepared to go anywhere in sector to plug gaps, reinforce, or take care of any bad guys that get through.

Be prepared to move back to battle positions oriented on PL TRUDY. If we have to move to these battle positions we will do so while artillery and CAS are hitting the enemy in our forward engagement areas. I want CO C to cover our move. Tm Mech you will move to the rear of Co C to BP 13 and become the reserve. In these BPs I want the forward Co/Tms to orient all fires on EA MAULER. Here we will complete his destruction.

We have plenty of artillery and CAS support, and I plan to use it. Use the artillery to disrupt him, take out BMPs, and hit dismounted troops. We will use the CAS against his recon elements, tanks and any C2 we might encounter.

Your priority of engineer work will be survivability. Dig in. I want all fighting vehicles in 2-step fighting positions. The engineers under my control will take care of obstacles in the EAs. FSO, I want to see a fire plan in 2 hours.

Briefback in 2 hours here at the TOC.

Battalion/Task Force OPORD (Defense)

(Suggested Example)

HQ, TF 1-1 Ar, 1st Bde, 23 Armd Div
Deep Desert, Kaliforn
__ 0900S May 1994

OPORD 12-2-3

Reference: Map, Fort Irwin Special (DARPA)

Task Organization

TM A	C/1-1 AR
A/1-1 AR (-)	
1/B/1-3 Mech	
1/A/23d Engr	TF Control
TM B	Scout Platoon
B/1-1 AR	MULE Tm
2/B/1-3 Mech	2/1/1/B/23 MI (GSR)
	Mortar Platoon
	1/A/1-440 ADA
TM Mech	1/442 Smoke Gen Co (DS)
B/1-3 Mech(-)	COLT 1&2
1/A/1-1 AR	
1/B/1-1 AR	
	TF TRAINS
	MST/B/1st FSB

1.   SITUATION

     A.   Enemy Forces: (Annex A, Intelligence Annex)

        (1)   Overview. The Qari Army has been pushed out of Kaliforn, and is currently an IM imposed holding areas in their homeland awaiting the outcome of ongoing peace talks. Their strength is estimated at 65-70%. They have no capability to use chemical or nuclear weapons.

        (2)   Disposition / Composition.

        TF 1-1 will likely face elements of the 55th Qari Ar Div (QAD). The 55th QAD consists of 551st and 552d Mech Brigades and the 555th Ar Bde. The 55th QAD is equipped with BMP and T-72 tanks. The enemy is at approximately 70% strength. Sightings of the Division recon will be key indicators of movement by the enemy.

        (3)   Probable Course of Action.

        The enemy is currently in holding areas but will probably attack once the peace negotiations bog down. The 55th QAD will probably send out recon units followed by a forward

security element or detachment with the mission to attempt to secure key terrain. The main body will follow and enter our sector in the vicinity of Red Pass and orient on avenues of approach from Red Pass to the Capital. Tanks will lead the BMP formations. We should not expect any special operations or terrorists activity.

    (4) Terrain and Weather:

    (a) Terrain- Observation and fires will generally favor the defender. Going west from PL BUNNY to PL BRENDA the somewhat flat terrain gives a slight advantage to the attacker. From PL BRENDA to PL TRUDY the high ground will favor the defender, the numerous wadis in this area will somewhat restrict the movement of friendly forces the attacker. Obstacles are the wadis throughout the area, the Tiefort Mtns, the high ground south of the Tieforts, and the "Whale".

    Key Terrain/Avenues of Approach: The foothills east of the Tieforts offer excellent observation to the north, east and south. The "Whale" offers excellent observation to the expected enemy avenue of advance. Red Pass Gap is the key to detection of the enemy. The numerous hard surface dirt roads in the sector could offer routes for a counterattack especially in the vicinity of PL ANKLE.

    (b) Weather - Clear and sunny skies for the next 72-96 hours. Sunrise at 0500 hrs; sunset at 1930 hrs. Wind direction is from the south, south west. Temperatures range from the mid 70s to the high 90s. Slight possibility of limited duration sandstorms through the daylight hours.

   B. Friendly Forces:

    (1) Brigade mission: 1st Brigade defends in sector NLT __ 0001 May 1994 from NJ _____ to NK_____ to destroy the 55th QAD.

    Brigade Commander's intent: I want to destroy the 55th Ar Div east of PL CATWOMAN to prevent any further military action in Kaliforn. We will defend in sector along PL CATWOMAN destroying the remnants of the 55th Ar Div. In the north we will shape the battlefield to force the enemy into the center sector where the heavy forces of the 1st Bde can be brought to bear on him for final destruction.

    (2) TF 1-3 Mech defends in sector to the north from NK_____ to NK_____ to prevent the enemy from passing to the north of the Tiefort Mts and force the enemy into TF 1-1 sector.

    (3) 3d Bn 8th Marine is in a strongpoint to the south of "Whale Gap" from NJ_____ to NJ_____, to deny the enemy that avenue of approach.

    (4) TF 1-2 Ar is the Brigade reserve and is located in BP 13 From NJ_____ to NK_____.

(5)   1/23 Attack Helicopter Bn will o/o attack enemy forces in EA COBRA.

(6)   1-50 FA (155, SP) DS to 1st Bde.

(7)   A/1-440 ADA *****

(8)   B/23 Engr Bn *****

(9)   ******

(10)   ******

(11)   90th Air Force provides 1st Bde 40 CAS sorties.

2.   MISSION: TF 1-1 Ar defends in sector from NJ 445980 to NK 470045 NLT __0001May 1994 to destroy elements of the 55th QAD and allow no penetration of PL CATWOMAN.

3.   EXECUTION:

Commander's Intent: I want to destroy the lead elements of the 55th QAD in EA PENGUIN, EA JOKER and EA BAT. In order to do this we will strip away his recon elements and destroy his advance forces forward of PL BUNNY with CAS and in EA COBRA with FA and CAS, then destroy his main body with direct and indirect fire, FA and CAS as he enters our EAs. The "Key" is EA JOKER: I want our obstacles and all fires to stop him in EA JOKER so that he loses his ability to maneuver and can be completely destroyed. I expect us to allow no penetration of PL CATWOMAN.

A.   Concept of the operation. This operation will be conducted in 4 phases. However, we will conduct it as one complete operation. The first phase will consists of identifying and destroying his recon forces and advance elements along PL BUNNY and in EA COBRA. The second phase will be to attrite forces with FA and CAS in EA PENGUIN; the third phase is final destruction in EAs JOKER and BAT; the fourth phase, if needed, will be repositioning of the TF to BP VARGAS.

(1)   Maneuver: Phase I consists of the Scout Platoon with the Marine MULE team attached along PL BUNNY oriented on NAI 4 and checkpoints 13 and 7. The remainder of the TF will occupy defensive positions along PL CATWOMAN. Phase II will begin as the advance guard approaches PL BUNNY and the scouts reposition to PL MARYANN. Phase II will be destruction of the advance guard in EA COBRA with CAS and FA. Scouts will withdraw to PL BRENDA as the main body enters EA COBRA and is engaged by CAS and FA. Scouts will maintain visual contact and withdraw to PL CATWOMAN as the main body enters EA PENGUIN. Co/Tms will continue to occupy defensive positions along PL CATWOMAN. Phase III will begin as the main body enters EAs JOKER and BAT. Co/Tms are defending along PL CATWOMAN. The reserve Co C will be committed during this phase if necessary. Phase III ends with the destruction of the enemy. Phase IV if needed will begin if there is a major penetration of PL CATWOMAN. TF 1-1 will reposition to BP VARGAS with TM B in the

north, Co C in the center and TM A in the south, TM Mech will occupy BP 7 as the reserve to complete the destruction of enemy forces in EA BETH.

        (2)   FIRES: Annex C, Fire Support Overlay)

        Priority of FA: Phase I & II - Scout Platoon
                        Phase III   - TM A, o/o Tm Mech
                        Phase IV   - Co C

        (3)   Intelligence/electronic warfare (IEW) ******

        (4)   Mines & Obstacles ********

   B.   Tasks to Maneuver Units:

        (1)   Team Mech:
             (a)   Responsible for obstacles in EA BAT.
             (b)   Coordinate with Co C for passage for Phase IV.
             (c)   Occupy BP 2, orient on TRP 55 (EA JOKER)and TRP 56 (EA BAT).
             (d)   Be prepared to displace to BP 6, serve as TF reserve.

        (2)   Tm A:
             (a)   Responsible for obstacles in EA JOKER.
             (b)   Responsible for placement and security of MULE Team upon release from Scout Platoon.
             (c)   Responsible for coordination with 3d Marine Battalion to the south.
             (d)   Coordinate with Scout Platoon Leader for passage on their withdrawal from PL BRENDA.
             (e)   Occupy BP 1, Orient on (EA JOKER)
             (f)   Be prepared to displace BP VARGAS 1, orient on TRPs 91 and 92 (EA BETH)

        (3)   Tm B:
             (a)   Responsible for coordination with TF 1-3 Mech to the north.

             (b)   Occupy BP 3, Orient on TRPs 57 & 59 (EA BAT).

             (c)   Be prepared to displace BP VARGAS 3, orient on TRPs 98 and 99 (EA BETH).

        (4)   Co C:
             (a)   Occupy BP VARGAS
             (b)   Cover TF displacement in Phase IV.
             (c)   TF reserve during Phases I-III.

(d)   Orient on TRPs 95 & 94 (EA BETH) during
Phase IV.

     (5)   Scouts:
        (a)   Phase I occupy OPs on PL BUNNY,
        (b)   Phase II occupy OPs on PL MARYANN, Orient on EA COBRA.
o/o displace to OPs on PL BRENDA, orient on EA PENGUIN, o/o conduct passage through TM
A, occupy position vicinity TF TOC
        (c)   Place and provide security to MULE team.
        (d)   Release MULE team to Team A upon displacement to PL
BRENDA.
        (e)   O/o establish OPs vicinity PL CATWOMAN during phase IV.

     (6)   Heavy Mortars:
        (a)   Phase I-IV: TM A
        (b)   Priority of targets: dismounts, smoke missions

C.   Tasks to Combat Support Units:

     (1)   A/1/440 ADA (V/S): priority of protection:
            Phase I   : Engineer assets
            Phase II : Co/Tms, C2
            Phase III : BP 1, C2
            Phase IV : BP VARGAS, C2

     (2)   A/23 Engr:

        (a)   Occupy BP 3A during Phase I & II.
        (b)   Occupy BP VARGAS 3 during Phase III
        (c)   Occupy BP 7 during Phase IV

D.	Coordinating Instructions:

    (1)	PIR

        (a)	Report BMP sighting
        (b)	Report C2 vehicle sighting
        (c)	Report T-72 sighting

    (2)	MOPP 0 in effect

    (3)	OEG: Negative risk

    (4)	Troop Safety Criteria: *****

    (5)	ADA Warning: YELLOW; Weapons Control Status: TIGHT

    (6)	TF Rehearsal: TBD

    (7)	Engagement priorities:	M1A1 - Tanks, Engr Veh, C2, ADA, APCs
M2/3 - Engr Veh, ADA, APCs
TOWs - Tanks, APCs, Engr Veh, ADA, C2.

4.	SERVICE SUPPORT:

A.	General (Annex E, CSS Overlay)

    (1)	Bde Rear (NK_____)
    (2)	Fld Tns (NK_____)
    (3)	Cbt Tns (NK_____)

B.	Materiel and Services

    (1)	Supply

        ******
        ******

    (2)	Services

        ******
        ******

        (3)   Transportation

               ******
               ******

        (4)   Maintenance

               ******
               ******

        (5)   Medical Evacuation and Hospitalization

               ******
               ******

C.   Personnel

        (1)   ******
                 ******

        (2)   ******
                 ******

D.   Miscellaneous. ******

5.   COMMAND AND CONTROL:

A.   Command

        (1)   Succession of command: TF XO, S-3, Tm A, Co C, Tm B, Tm Mech in order.

        (2)   TF Cdr located with TM A

        (3)   TF TOC, (NK___), o/o (NK___)

        (4)   Bde TOC, (NK___); Bde TAC (NK___)

B.   Signal

        (1)   SOI index**** in effect
        (2)   Radio minimize until Scouts make contact with enemy.
        (3)   Secure fill change at__0100 May 1994
        (4)   Lifting and shifting fires: 2 Green Star Clusters
        (5)   Signal to cease fire: 2 Red Star Clusters
        (6)   IFF Mode 3; IFF Mode 4 IAW Code Book # **.

ACKNOWLEDGE:

WHITE
LTC

OFFICIAL:

BLACK
S-3

ANNEXES: A - DST Overlay
              B - Operations Overlay
              C - Fire Support Overlay
              D - Obstacle Overlay (NA)

The following matrices are included with this OPORD:
              Synchronization (TBP)
              Execution (TBP)
              Fire Support with target list(TBP)
              Engineer Execution (TBP)
              CSS (TBP)

DISTRIBUTION: A+

OFFENSIVE OPERATIONS

(Suggested Example)

BRIGADE

(Suggested Example)

BRIGADE CONCEPT OF THE OPERATION (OFFENSE)

The Brigade Commander has his battalion commanders and staff at the Brigade TOC for issuance of the OPORD.

Commander's Planning Guidance

OK Gents, listen up it's time to kick that madman out of Kaliforn. We will commence offensive operations in <u>24 hours</u>.

I believe that the high ground in the vicinity of RED PASS is the key to the defense of the 555th Qari Ar Bde. If he has the capability to launch any type of counterattack, after the pounding he has taken these pass few days from the Air Force, it will come from the north. In this respect I am worried about the tank company which aerial recon has pinpointed in the northeast portion of OBJ KING. I have asked the MarDiv commander to use the Apache battalion which he has OPCON to try to take out the counterattack force.

Here is how I want us to attack. The absolute key to the success of this operation is a smooth passage through the 6th MarDiv and then for us to quickly move into our MTC (movement to contact). I want my TOC to collocate with that of the 5th Bde, 6th MarDiv as we pass through them. The passage of lines is also complicated so don't take it lightly, I want it rehearsed at every level. I want 2 passage lanes through the penetration.

I want to take control of the battle as soon as my lead battalions complete the passage, so work out the battle handover. Also, workout how the Marine brigade can support us with indirect and any direct fire. FSO we have a lot of artillery and CAS supporting this action and I want to use it to the it as a combat multiplier.

Once the passage is completed I want to move quickly to seize OBJ KING. The Qari Ar Bde is not in prepared defenses since we've caught them with their pants down. However, they are prepared to fight, so don't take them lightly.

The brigade will conduct a movement to contact with Task Forces in sector. I want to conduct a MTC since the exact location of the enemy is still a little unclear.

The Qari commanders were not expecting us to be able to conduct offensive operations so quickly so their defenses aren't really prepared. However, the 555th Qari Brigade commander is pretty good according to our intelligence. He will put out forces to try to get a fix on us and slow us down. We should encounter elements of his recon somewhere in the vicinity of PL FOOT. The OPORD has a couple of TAIs where the S-2 thinks his recon elements should be located. His FSE should be somewhere in the vicinity of PL ANKLE, again the OPORD has some TAIs that give our best guess as to where. We will hit his main defense belt along PL THIGH. This is also where we could be hit with any counterattack he can muster so keep an eye to your north.

TF 1-1 Armor will conduct a movement to contact in the north, move along AXIS RED. You are to eliminate every enemy position platoon size and larger in your sector. You will secure and consolidate the northern part of OBJ KING .

TF 1-3 Mech will conduct a movement to contact in the south along AXIS WHITE. You are to eliminate every enemy position platoon size and larger in your sector. You will secure and consolidate the southern part of OBJ KING .

TF 1-2 Armor will follow TF 1-3 and be prepared to move any where in the brigade sector to assist in destroying the enemy. You will secure and consolidate the center portion of OBJ KING A and orient on RED PASS.

There is a lot of artillery and CAS supporting this operation. Use it, call in the CAS to take out any threat that is really slowing you down, especially any of his recon or forward security elements.

I want to get to OBJ KING quickly.

OK, we have 24 hours to get ready. Battalion commanders give me a briefback in 2 hours.

RED
PASS

OBJ
KING

WHALE

TF 1-1
II
TF 1-3

TIEFORT

8
X
1/23
1

III
1

III
2

1

III
3

1

5 MEF
XXX
10 (US)
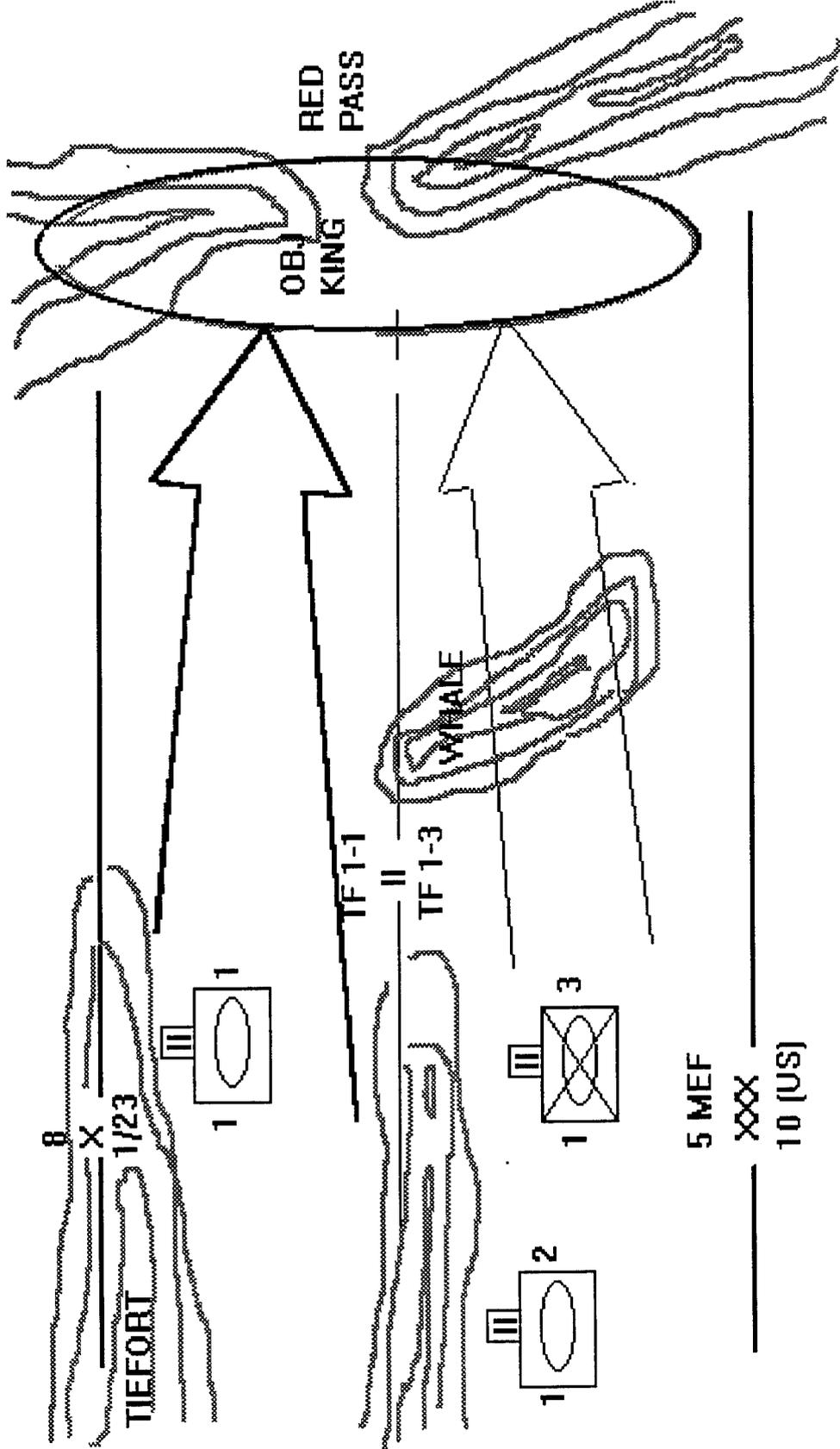
BRIGADE OFFENSE

**Brigade OPORD (Offense)
with control measure coordinates**

(Suggested Example)

___ MAY 1994
NJ------

OPORD 01-1

REFERENCE:
Maps, 1:50,000, sheets 1,2,3,4, Fort Irwin Special(DARPA)

Time Zone Used Throughout The Order:SIERRA

TASK ORGANIZATION:

TF 1-1 AR (MIA2)	BDE CONTROL
1-1 AR (-)	1-50 FA (155, SP) (DS)
B/1-3 Mech	A/23 Engr (-)
1/A/23d Engr	A/1-440 ADA Bn (V/S)(-)
1/A/1-440 ADA (V/S)	1/23 Chem Co (Decon) (DS)
C/4/A/1-440 ADA (S)	1/A/23 MI Bn (C&J) (DS)
2/1/1/B/23d MI Bn (GSR)	1/23 MP Co (DS)
1/442 Smoke Gen Co (OPCON)	
COLT 1 & 2	
MULE 1 (USMC) (ATCH)	BDE TRAINS
	1st Fwd Spt Bn (DS)

TF 1-2 AR (MIA2)
    1-2 AR (-)
    A/1-3 Mech
    A/4/A/1-440 ADA (S)
    COLT 3

TF 1-3 MECH (M2)
    1-3 Mech (-)
    D/1-1 AR
    D/1-2 AR
    2/A/23d Engr
    2/A/1-440 ADA (V/S)
    B/4/A/1-440 ADA (S)
    1/1/1/B/23 MI Bn (GSR)
    MULE 2 (USMC) (ATCH)

1.   SITUATION: (Annex A - Intelligence Overlay)

        a.   Enemy Forces (See Appendix 1 to Annex A)

                Overview. The Qari Army invaded Kaliforn 3 weeks ago and almost succeeded in taking the Irwinfort Province. The Qari Army is thinning their forces in what seems to be a posturing to go on the offensive.

                The 55th Qari Ar Div is currently located in hasty defensive positions in the vicinity of the capital of Irwinfort Province. The enemy strength is estimated to be 75%. The enemy is equipped with BMPs, T-72M tanks, and has ADA in the form of ZSU 23-4 and man-packed missiles. Elements of the 555th Qari Ar Bde are currently occupying hasty defensive positions in the vicinity of the Tiefort Mtns and Red Pass. The 555th Ar Bde has been hit repeatedly with air strikes and attack helicopters and his strength is estimated to be 65-70%. The Qari Army does not have a nuclear capability but has limited chemical capability. They have not employed chemical weapons to date. There is no threat of any terrorist activity, the locals are considered friendly.

        b.   Friendly Forces.

                (1)   7th MarDiv conducts a passage through the penetration opened by the 6th MarDiv at approximately __1200S May 1994, then conducts a movement to contact to find and destroy the 555th Qari Ar Bde vicinity OBJ KING (NK_____). The division commander's intent is to pass quickly through the penetration and move rapidly in sector to keep the Qari units off balance and not allowing time to establish a solid defense. Division will fight the deep battle with EW, FA, Air Force and Marine CAS and Army attack helicopters.

                (2)   6th MarDiv conducts an attack at __0001S May 1994 in sector to open a penetration for the 7th MarDiv.

                (3)   8th Bde, 7th MarDiv conducts a movement to contact in sector to our north oriented on OBJ KING B.

                (4)   9th Bde, 7th MarDiv is the Division reserve and will follow 1st Bde, 23d Ar Div in sector and be prepared to conduct operations throughout the division sector.

                (5)   1st Bn 23 Aviation will conduct deep attacks against the enemy counterattack force in the vicinity of OBJ KING.

                (6)   Elements of the 90th Air Force provides tactical air support. Air superiority exists. Division has 40 CAS sorties.

Attachments and Detachments. See OPORD

2.   MISSION. 1st Bde conducts passage through 6th MarDiv at __1200S May 1994,
conducts movement to contact in sector, attacks and destroys enemy forces in sector to seize OBJ
KING.

3.   EXECUTION.

        a.   Concept of the Operation. (Annex B - Operations Overlay).

                We are the Division's main effort and I intend to quickly seize OBJ KING with a
combination of speed, security and combat power. The Brigade main effort will be with a tank-
heavy task force in the north moving along AXIS RED, a balanced task force in the south
moving along AXIS WHITE, with a Tank-heavy task force following on AXIS WHITE. I see us
initially meeting the enemy along PL FOOT where I intend to take out his recon with CAS and
then along PL ANKLE where we should run into his FSE. Clear these forces out as rapidly as
possible with CAS and direct fire and then I want the lead TFs to draw abreast at PL ANKLE for
the final rapid assault across PL THIGH, where the threat will have his main defenses, onto OBJ
KING. I intend to have OBJ KNIGHT secured NLT 1800 hrs.

                (1)   Maneuver. 1st Bde passes through 6th MarDiv and conducts movement to
contact in 3 phases.

                        (a)   Phase 1: At __0600S Mayember 1994 1st Bde will conduct a
tactical movement with TF 1-1 along RT FINGER and TF 1-3 followed by TF 1-2 along RT
HAND and pass through the penetration opened by 6th MarDiv,

                        (b)   Phase 2: NLT __1220S Mayember 1994, TF 1-1 in the north and
TF 1-3 in the south conduct a movement to contact in sector to locate, find, fix and destroy
enemy forces in sector and conduct an assault of the enemy main defenses along PL THIGH and
continue the attack to seize OBJ KING . Both TFs will eliminate all enemy recon elements, the
FSE and units platoon size and larger in their respective sectors. TF 1-2 will be prepared to
assist either of the lead TFs. TF 1-2 and TF 1-3 will open a penetration for the attack of TF 1-2
through OBJ KING, if needed..

                        (c)   TF 1-2 will attack through OBJ KING and seize and hold Red
Pass. PL HIP east of Red Pass is the brigade LOA.

                (2)   FIRES. Annex C (Fire overlay). Division will fire a 15 minute
conventional prep east of OBJ KNIGHT beginning at __1220S Mayember 1994 to assist in the
brigade's movement into sector. Priority of FA and CAS:

                        Phase 1: Bde control
                        Phase 2: TF 1-1, o/o 1-3
                        Phase 3: TF 1-2

(3)   INTELLIGENCE/ELECTRONIC WARFARE (IEW) (Appendix 1 to Annex A-TBP) (Annex D - DST)

(a)   Priority of intelligence collecting is locating and identifying counterattack force (tank companies), forward enemy defensive positions, artillery firing positions, and BN and higher command posts.

(b)   Priority of offensive EW. TBP (N/A)

(4)   OBSTACLES.

(a)   Enemy has had minimal time to prepare obstacles. Priority of engineer effort is lead task forces.

(b)   Priority of engineer mission is to mobility, survivability and countermobility in that order.

(5)   DECEPTION. TBP (N/A)

b.   TASKS TO MANEUVER UNITS:

(1)   TF 1-1 AR

(a)   Clear sector of all platoon size and larger enemy forces.

(b)   Clear sector of all enemy recon elements.

(c)   Clear sector of all enemy tanks.

(d)   Man Contact Point 9 (OBJ KING).

(e)   Clear Check Points 1, 2, 4, 5, 6, 8, & 10. 11, 12, 13.

(f)   Be prepared to provide quick reaction to CATK.

(2)   TF 1-3 MECH
        TBP

(3)   TF 1-2 AR
        TBP

c.   TASKS TO COMBAT SUPPORT UNITS.

(1)   ALO

      (a)   Air Support
           (1)   General
               -a- 1st Bde allocated 30 sorties
               -b- Priority of employment tanks,BMPs, artillery, and CPs
      (b)   Allocation for planning purposes:
           -a- TF 1-1   13 sorties
           -b- TF 1-3   13 sorties
           -c- Bde control   4 sorties

   (2)   Field Artillery Support

      (a)   General
           -a- Priority of GS fires to counterfire and close support in that
order....

           -b- Counterfire Priority....

           -c- Copperhead Priority....

           -d- Priority Targets allocated as follows:
                Phase 2 TF 1-1 - 2, TF 1-3 -2.
                Phase 3 TF 1-2 - 2

           -e- Fire support coordinating instructions

                * 7th MarDiv CFL is ....

                * ACA HEAD: o/o no indirect fires impacting east of PL

                * All DPICM ......

                * All suppressive fires on OPs and ground elements will be
attacked with HE/VT

      (b)   Organization for Combat:

      1-50 (155, SP) FA: DS 1st Bde
      Remainder of arty TBP

   (3)   A/1-440 ADA TBP

   (4)   A/23 Engr TBP

   (5)   1/23 Chem Co TBP

         (6)   1/A/23 MI Bn (C&J) TBP

         (7)   1/23 MP Co TBP

    d.   Coordinating instructions.

         (1)   Road Movement TBP

         (2)   PIR:

               (a)   Where and when will CATK force be employed?
               (b)   Where is enemy main defense belt?

         (3)   By-passing enemy tanks, recon elements and units platoon size or larger is
prohibited.

         (4)   MOPP: MOPP level II

         (5)   OEG: Negative risk

         (6)   Troop Safety Criteria: N/A

         (7)   Air Defense Warning: yellow: Weapons Control Status: Tight

         (8).   All TFs be prepared to implement SEAD missions for friendly air assets

         (9)   Bde Rehearsal: Location Bde TAC _____ hrs.

         (10)   Counterterrorists Operations: N/A

4.   SERVICE SUPPORT. ANNEX F - TBP

5.   COMMAND AND SIGNAL

    a.   Command:

        (1)   Succession of Command: Per SOP

        (2)   Bde TOC Located at _____; o/o displaces to _____; o/o
displaces to _____

        (3)   Bde TAC located vic_____; o/o displaces to _____.

        (4)   Alternate TOC is Bde TAC, 1-50 FA in order

        (5)   Rear TOC located at _____.

    b.   Signal:

        (1)   SOI Index XX-X in effect

        (2)   Radio Listening silence in effect until H-hour

        (3)   IFF mode 3A; IFF mode 4 IAW Code Book #1A.

ACKNOWLEDGE:

                                                            EAGLE
                                                            COL
OFFICIAL:

STONE
S-3

ANNEXES: A - Intelligence Overlay
            B - Operations Overlay
            C - Fire Support Overlay
            D - DST (overlay)
            E - Synch Matrix - TBP
            F - Service Support - TBP
            G- Control Measure Coordinates

DISTRIBUTION: A

ANNEX A (INTELLIGENCE) to OPORD No. 01-1
Reference: Maps 1:50,000 Fort Irwin Special (DARPA); Situation Template (UNCLASS).

Time zone used throughout the order: SIERRA

1. SUMMARY OF ENEMY SITUATION:

The 55th Qari Armor Division (QAD) has established a hasty defense running north to south along the 54 grid line. The QAD defense is in two echelons with the 555th Armor Bde (QAB) and a MRR in the first echelon and two TK REGTs in the second. Qari defensive doctrine uses regiments/brigades in a linear formation and establishes depth through a series of regiments/brigades in defensive belts.

The 1st BDE will be attacking the 555th QAB that is attached to the 55th QAD. The 555th QAB is a reserve brigade that is attached to the 55th GAD to strengthen the division after the losses it has taken during its assault in to Kaliforn.

The 555th QAB defends from NJ5694 to NK5209 along the high ground near RED PASS (NK5503). Air Force reconnaissance indicates that the 555th QAB has established a hasty defense with two tank battalions in the north defending RED PASS and a motorized rifle battalion in the south.

The 55th QAD has established several OPs and actively patrols well in front of its first echelon defensive positions (up to 20 kilometers). OPs have been located in the vicinity of NK3800, NK3703, and NJ4898. The Qari Army normally only maintains an OP for less than 24 hours and then moves. Last night TF 1-3 Mech made contact with a Qari reconnaissance patrol in the vicinity of NJ3996 and destroyed a BTR 60; other Qari vehicles withdrew to the east. A command post (555th QAB CP?) has been located in the vicinity of NK5800.

The 555th QAB (based upon a Soviet tank regiment) is now at 60 to 75% strength and is organized into two tank battalions (T-72 equipped) and one motorized rifle battalion (BMP equipped).

Qari forces are predominately equipped with Russian equipment and use Soviet Military Doctrine. The 555th QAB has T-72 tanks, and BMPs. Tank and MR battalions can be expected to be well covered by air defense systems that include the SA 6, SA 9, SA 14, ZSU-23-4, ZSU-57-2, and possibly GEPARDs. Most of the Qari Air Force has been destroyed and it is not capable of achieving local air superiority over Kaliforn territory. However, attack helicopters can be expected in the QAD's sector. Qari has Hinds and BO-105s with HOT AT missiles.

2. ESSENTIAL ELEMENTS OF INFORMATION

    a.   Location of 555th QAB forward security element.

    b.   Location of QAD OPs.

    c.   Location and strength of the QAD first echelon defense.

    d.   Location and strength of the QAD second echelon defense.

    e.   Location of Qari RAGs, DAGs, and reserves.

3. INTELLIGENCE ACQUISITION TASKS

    a.   TF 1-1 AR:

        (1)   Report contact with Qari reconnaissance, forward security elements, and main body.

        (2) Report locations of Qari C2 elements.

        (3) Report use of enemy air assets.

        (4) Report use of chemical weapons and/or locations of chemical delivery systems.

    b.   TF 1-2 AR:

    c.   TF 1-3 Mech:

4. MEASURES FOR HANDLING PERSONNEL, DOCUMENTS, AND MATERIAL
No change from BDE SOP.

5. DOCUMENTS AND/OR EQUIPMENT REQUIRED

Transmit all requests for intelligence information to the BDE S2 Thru BN S2s.

6. COUNTERINTELLIGENCE
No change from BDE SOP.

7. REPORTS AND DISTRIBUTION
No change from BDE SOP.

<div align="center">

EAGLE
COL

</div>

ANNEX G- CONTROL MEASURE COORDINATES

NAME	COORDINATES	REMARKS
PHASE LINE LEG	NK 269030-NK 270000-NJ 269955	
PHASE LINE FOOT	NK 332029-NK 344991-NJ 346964	
PHASE LINE TOE	NK 395045-NJ 390999-NJ 394980	
PHASE LINE ANKLE	NK 489058-NK 485030-NJ 466978	Road
PHASE LINE THIGH	NK 538060-NK 514013-NJ 513980	Road
CHECKPOINT 4	NK 334010	CHECK AND CLEAR
CHECKPOINT 2	NJ342986	CHECK AND CLEAR
CHECKPOINT 1	NK 356007	CHECK AND CLEAR
CHECKPOINT 5	NK 370000	CHECK AND CLEAR
CHECKPOINT 6	NJ 410996	CHECK AND CLEAR
CHECKPOINT 8	NJ 440987	CHECK AND CLEAR
CHECKPOINT 10	NJ 465986	CHECK AND CLEAR
CHECKPOINT 11	NJ 496989	CHECK AND CLEAR
CHECKPOINT 12	NJ 522998	CHECK AND CLEAR
CHECKPOINT 13	NK 572018	CHECK AND CLEAR ESTABLISH OBSERVATION POST WITH MULE TEAM
CONTACT POINT 9	NJ 581998	MAN AND ESTABLISH OBSERVATION POST

BATTALION/TASK FORCE

(Suggested Example)

BATTALION/TASK FORCE CONCEPT OF THE OPERATION (OFFENSE)

OK Gents, listen up, it's showtime. All our preliminary planning and preparation has paid off. We have an opportunity to catch the Qari Army in a bad fix. He isn't expecting an attack and that is exactly what we are going to do. We move at 0600 hours tomorrow morning. I know that isn't a lot of time but we've worked on this since we've been in country and as I said it paid off.

(We pick up the guidance after the passage of lines)

As we complete our passage, I want the scouts with the Mule Team out to our front. The remainder of the task force will move in a diamond formation. Tm A you will be our advance guard; Tm B you will move in the north; Tm Mech you will move in the south. Co C, you are the trail unit; I want you to be prepared to move forward or to the flanks quickly to reinforce any of the other teams. All of you have checkpoints to guide your movement. Use them. These are likely locations of the enemy and I want to destroy them.

Scouts, we should make initial contact along PL FOOT; especially pay attention to Checkpoints 1 and 3. The Qari recon will probably be in that area. If he is, call in CAS and make sure you use the MULEs.

Tm A follow about 5 kms behind the scouts; be prepared to assist him as needed.

TM Mech and Tm B, follow about 3-5 kms behind Tm A. Co C you should be 3-4 kms behind the Teams to your front.

We should encounter his forward security element somewhere in the vicinity of PL ANKLE. Expect BMPs and tanks. Again, use all available assets to eliminate these vehicles. Use FA or CAS; I want to preserve my ground forces for the assault onto KING.

As I said earlier, he is in hasty defense positions; we should move quickly through the recon and FSE. We should encounter his main defenses along PL THIGH. When we start the final assault onto OBJ KING, I want it to be violent and quick.

Tm B will establish support by fire position vicinity of Checkpoint 13, engaging targets within the objective area. O/O Tm Mech will attack and secure OBJ MECH and Tm A will attack and secure OBJ A. After OBJs MECH and A are secure, Co C will attack and secure OBJ C. Scouts will establish a screen on the northeast side of OBJ KING A. Tm B be prepared to assist the passage of TF 1-2 Armor. After securing your objective, I want you to establish hasty defensive positions orienting to the east. Scouts be prepared to establish contact with TF 1-2.

I want a brief back in 1 hour. TF rehearsal at 1700 hours at this location. OK!, it's showtime.

Battalion/Task Force OPORD (Offense)

(Suggested Example)

OPORD 12-2-2

Reference: Map, Fort Irwin Special (DARPA)

Task Organization

TM A	C/1-1 AR
A/1-1 AR (-)	
1/B/1-3 Mech	
, 1/A/23d Engr	TF Control
TM B	Scout Platoon
B/1-1 AR	MULE Tm
2/B/1-3 Mech	2/1/1/B/23 MI (GSR)
	Mortar Platoon
	1/A/1-440 ADA
TM Mech	1/442 Smoke gen Co (DS)
B/1-3 Mech(-)	COLT 1&2
1/A/1-1 AR	
1/B/1-1 AR	

TF TRAINS
MST/B/1st FSB

1.   SITUATION

    a.   Enemy Forces

        (1)   Overview. The allied air forces have slowed down the Qari Army in their preparation to continue their attacks in Kaliforn. In our zone, the 55th Qari Armd Division has gone to ground and is currently in a hasty defense. The enemy has chemical capability but has not used them due to prevailing winds; it does not have nuclear capability.

        (2)   Composition / Disposition: The Qari 55th Armd Div is equipped with BMP-1, BTR-60, T-72M tanks. Current enemy strength is 65-70%. Current enemy disposition for the 555th Qari Ar Bde in our zone is shown on Intel Overlay. The brigade recon elements are approximately 15 kilometers forward of his main defense and his forward security element is 4-6 kilometers forward.

        (3)   Probable Courses of Action: Enemy will remain in hasty defense while he looks for the opportunity to continue his attack

(4)   Terrain and Weather:

(a)   Terrain- Observation and fires favor both sides up to PL Foot. Going east from PL Foot to PL Ankle the high ground will favor the defender, the numerous wadis in this area will somewhat restrict the movement of friendly forces, from PL Ankle to the Objective the terrain again becomes more open and is favorable to the attacker. The hilly terrain of the Objective favors the defender. Obstacles are the wadis throughout the area, the Tiefort Mtns, the high ground south of the Tieforts, and the "Whale".

Key Terrain/Avenues of Approach: The foothills west of the Tieforts offer excellent observation to the north, west and south. The "Whale" offers excellent observation along the TF axis of advance. Red Gap is the key to the enemy withdrawal. The numerous hardsurface dirt roads in the sector could offer routes for a counterattack especially in the vicinity of PL ANKLE.

(b)   Weather - Clear and sunny skies for the next 72-96 hours. Sunrise at 0500 hrs; sunset at 1930 hrs. Wind direction is from the south, south west. Temperatures range from the mid 70s to the high 90s.

b.   Friendly Forces.

(1)   1st Bde conducts a passage of lines through the 6th MarDiv and a movement to contact __0600S May 94 to find, fix and destroy elements of the 555th Ar Bde located in the vicinity of OBJ KING. The brigade commander's intent is to move quickly, in a "V" formation with lead TFs conducting a movement to contact in their zones.

(2)   TF 1-3 Mech conducts a movement to contact to our south orienting on OBJ KING B.

(3)   On our northern flank, 8th brigade, 7th MarDiv is attacking to seize OBJ KING NORTH.

(4)   6th MarDiv will attack to our front and open a penetration for the 1st Bde and then assist in the forward passage of the brigade.

(5)   TF 1-2 Armor follows TF 1-3 Mech in zone as the brigade reserve and is prepared to assist throughout the sector. It will pass through lead TFs on OBJ KING to secure approaches to Red Pass along PL HIP

(6)   1-50 (155, SP) FA DS to 1st Bde. Priority of fires to TF 1-1 then to TF 1-3.

(7)   A/1-440 ADA (V/S)(-) provides air protection to Bde.

(8)   A/23d Engr (-) provides spt to bde.

(9)   1/23 CML Co (Decon) spts bde in BSA

(10)   1/23 MP Co spts Bde handling of EPWs

(11)   90th Air Force provides close air support to 1st Bde with 30 sorties. CAS will be on station 10 minutes prior to scheduled mission.

    c.   Attachment/Detachments. See Task Organization

2.   MISSION. TF 1-1 AR conducts a forward passage through 6th MarDiv and movement to contact at __0600S May 1994 in zone to OBJ KING (NK 565030) to find, fix and destroy the enemy.

3.   EXECUTION

    Intent. I want to move quickly after we pass through the Marines from the RP all the way to OBJ KING. I don't expect any substantial enemy contact, with the exception of recon elements until we reach the objective. As we approach PL FOOT, I want the scouts to find and take out the recon elements that are there. Use CAS if we have it on station. Although the enemy situation is a little vague, the most dangerous place is as we approach PL ANKLE, there we should encounter the FSE and also there is an excellent CATK route into our northern flank. This is when I want the scouts to have an eyes both to the front and to the north. Also at this point, I want the advance guard to go into bounding overwatch. The other Co/Tms will maintain a distance that allows mutual support throughout the maneuver, and be able to react instantly. I want the scouts out acting as a security force forward of the TF. Scouts will have the Marine MULE team with them and I expect them to be used in CAS missions. Battle drills must be executed with precision. As for OBJ KING, I want to secure it rapidly, we must pass TF 1-2 AR through, and consolidate it within 15 minutes of our occupation.

    a.   Concept of the Operation. (See Annex A, Operations Overlay)

        (1)   Maneuver. TF 1-1 AR will conduct movement to contact in three phases: During Phase I of the operation the TF will move from its current location to an attack position. Phase II is the forward passage through 6th MarDiv and the movement to contact. Phase III is the seizure, consolidation and reorganization on OBJ KING.

Phase I (ATK PSN CAVE to LD) The TF will move to occupy Atk Psn CAVE. The order of march per coordinating instructions. Occupy IAW ops overlay. Conduct passage through 6th MarDiv o/o.
Order of march on Lane 1-- Scouts, TM A, followed by engr plt, mortar plt, TM B and TOC, lane 2-- TM Mech, followed by ADA plt, Co C and Cbt Tns.

Phase II (LD to OBJ KING) Upon passage, scouts conduct screen forward of TF. Immediately after passage, TF will deploy into a diamond formation with TM A leading as the advance guard (TF main effort). Tm Mech will be in the south, TM B in the north and Co C in trail as TF reserve. TM A will move in Co wedge/pats in wedge, using traveling overwatch until PL ANKLE. Other Co/Tms will use traveling technique, but will stay 3 ks behind TM A. At PL ANKLE, TM A will begin bounding overwatch to PL THIGH. Other Co/Tms will continue using traveling but will slow their speed, and cut the distance between TM A. Using checkpoints along the axis, the TF will move oriented on OBJ KING. Upon contact of an enemy element platoon size or larger, the Co/Tm in contact will establish a support by fire position and the TF will Maneuver of the enemy flank IAW TACSOP.

Phase III (Seizure/Consolidation/Reorganization on OBJ KING). The enemy forces on OBJ KING destroyed by a TF hasty attack. TM B will establish a support by fire position vicinity checkpoint___ engaging targets within the obj area and the scouts will screen the northern flank. O/O Tm Mech will attack and secure OBJ MECH and TM A will pass to the rear of TM Mech to attack and secure OBJ A. After OBJ MECH and OBJ A are secure Co C will attack to secure OBJ C. O/o TM B will assist the passage of TF 1-2 Ar. Upon occupying their objectives within OBJ KING, Co/Tms will establish hasty defensive positions orienting east. Scouts will establish contact with TF 1-2 Ar to the east.

(2)   Fires. (See Annex B, Fires Overlay) Fires will be used to suppress forces smaller than platoon forces and to neutralize forces platoon size or larger. FA priority of fires Scouts, TM A, TM B, TM Mech, CO C in order. Mortar fires same priority as FA,. 13 CAS sorties are available to the TF. CAS will be used eliminate enemy recon and tanks.

(3)   Obstacles. Priority of engineer effort is mobility.

b.   Tasks to Maneuver units:

(1)   TM A:

(a)   TF advance guard- maintain center of zone orientating on checkpoints 2, 5, 6, 8, 11, 12, 13.

(b)   Secure OBJ KING A, orient TRP 222 to TRP 333.

(2)   TM Mech:

    (a)   Orient on checkpoint 15, 17, 20, and 23
    (b)   Est contact with co from TF 1-3 at coord pt D.
    (c)   Secure OBJ Mech orient between XXXX and XXXX.

(3)   TM B:

    (a)   Orient on checkpoints 3, 7, 9, 19, and 21
    (b)   Secure OBJ KING B orient between XXXX and XXXX.

(4)   Cc C:

    (a)   As TF reserve, provide rear security and follow center of axis, orienting on checkpoints 6, 12, 14, 16, 18 22, and 24.
    (b)   Assist passage of TF 1-2 AR

(5)   Scout Plt:

    (a)   Receive, protect and place MULE team as required.
    (b)   After seizure of OBJ KING, est contact point at NK 579003.
    (c)   After seizure of OBJ KING, est OP with MULE at OP JULIET.

(6)   Mortar Plt:

    (a)   Controlled by FSO.
    (b)   Operate in split section to provide continuous support to scouts.

c.   Tasks to Combat Support Units:

(1)   1/A/1-440 ADA
       XXXXXXXXX
(2)   1/A/23d Engr
       XXXXXXXXX
(3)   MULE Team
       Attached to scout platoon.

d.   Coordinating Instructions:

(1)   Report by-passing of enemy elements
(2)   Movement Instructions- per Para 3a 1 of this OPORD.

        (3)   PIR:
               (a)   Enemy MOPP levels
               (b)   All Tanks
               (c)   Cmd and control vehicles
        (4)   MOPP II in effect
        (5)   ADA warning- yellow; wpns control status-tight.
        (6)   Report all checkpoints and phase lines.

4.   Service Support- N/A

5.   Command and Signal:

    a.   Command:

        (1)   TF TOC init loc vic NJ XXXX, o/o inside TF diamond
        (2)   Bn Cdr will travel in center of diamond formation. S-3 will be with
TF Mech. TF XO will be with the TOC.
        (3)   Succession of Cmd. Per SOP
        (4)   Brigade TOC init loc vic NJ XXXXXX.

    b.   Signal:

        (1)   SOI index X-XX in effect
        (2)   Two green star clusters=lift and shift fires
        (3)   Red star cluster=Cease fire, friendly troops
        (4)   Red smoke= obstacle
        (5)   Yellow smoke= breach lane
        (6)   Brief back in 2 hrs at this loc.

Acknowledge: Custer
                                        LTC

Reno
S-3

Annex A Opns and Fires Overlay

Dist: A

GLOSSARY

AOC	Air Force Operations Center
AOR	Area of Responsibility
CAS	Close Air Support
Irwinfort	a province near the coast of the Pacten Ocean
JFACC	Joint Force Air Component Commander
JFC	Joint Force Commander
JFLCC	Joint Force Land Component Commander
Kaliforn	allied nation in the Middle East
MEF	Marine Expeditionary Force
Nevad/Ariz	Neighboring countries
Quai	Mid-east country
Raddam Inzein	the Qari strongman

ACRONYMS/ABBREVIATIONS

AAA	- Anti-Aircraft Artillery
ABCC	- Airborne Battlefield Command and Control Center
ACA	- Airspace Coordination Area
ACC	- Air Component Commander
ADA	- Air Defense Artillery
ALO	- Air Liaison Officer
ALCC	- Air Lift Coordination Center
ANGLICO	- Air and Naval Gunfire Liaison Company
AOC	- Air Operations Center
AOR	- Area of Responsibility
AR	- Armor
ARLO	- Air Reconnaissance Liaison Officer
ASOC	- Air Support Operations Center
A2C2	- Army Airspace Command and Control Element
BCE	- Battlefield Coordination Element
BDE	- Brigade
BN	- Battalion
CAS	- Close Air Support
CCT	- Combat Control Team
CDR	- Commander
CO/TM	- Company/Team
CP	- Command Post (Ground Forces term)
CP	- Contact Point (point where the aircraft makes initial radio contact with final controller)
CRC	- Control and Report Center
CRP	- Combat Recon Patrol (OPFOR unit)
ETAC	- Enlisted Terminal Attack Controller
FA	- Field Artillery
FACP	- Forward Air Control Post (Radar)
FAC-A	- Forward Air Controller - Air (Marine Corps term)
FAC-G	- Forward Air Controller - Ground (Marine Corps term)
FIST	- Fire Support Team
FSE	- Fire Support Element
FSE	- Forward Support Element (OPFOR unit)
FSO	- Fire Support Officer
GLO	- Ground Liaison Officer
IP	- Initial Point (Point at which the aircraft starts timed run toward pull-up point)
JFACC	- Joint Forces Air Component Commander
JFC	- Joint Forces Commander
JFLCC	- Joint Forces Land Component Commander
LCC	- Land Component Commander

ACRONYMS/ABBREVIATIONS (cont)

MarDiv	- Marine Division
Mech	- Mechanized
MEF	- Marine Expeditionary Force
MLE	- Marine Liaison Element
MLRS	- Multiple Launched Rocket System
MULE	- Marine Laser System
NAI	- Named Area of Interest
NLT	- Not Later Than
OBJ	- Objective
OPORD	- Operations Order
PL	- Phase Line
PUP	- Pull-up Point (point where an aircraft at low level begins climb to identify and attack target)
PRF Code	- Pulse Repetition Frequency Code (Lasers)
SEAD	- Suppression of Enemy Air Defenses
SOF	- Special Operations Forces (i.e. Rangers, seals, etc.)
TAC-A	- Tactical Air Control - Airborne
TACP	- Tactical Air Control Party
TAI	- Target Area of Interest
TF	- Task Force
UAV	- Unmanned Aerial Vehicle
WOC	- Wing Operations Center
ZSU 23-4	- Soviet made Air Defense Weapon (4 machine guns and internal radar)

iMILITARY UNITS

ARMY - Normally consists of 2 or more Corps

CORPS - Normally consists of 2 or more Divisions

Marine Expeditionary Force - Similar to a Corps

Division - Normally consists of 3 Brigades, 1 Artillery Brigade, 1 Aviation Brigade, 1 Brigade size support unit (support command) and numerous separate battalions.

Brigade - Normally consists of 3 or more Maneuver Battalions, plus 1 or more artillery battalions from the division artillery brigade, and 1 support battalion from the division support command

Battalions (maneuver) - Armor or Mechanized Infantry normally consists of 4 like companies (i.e. an armor battalion has 4 tank companies)

Battalion/Task Force- A maneuver battalion that has a mix of companies (i.e. an armor heavy task force would normally have 3 tank companies and 1 mechanized infantry company. A mechanized Infantry heavy task force would have the opposite of the armor task force. A balanced task force would have 2 of each.)

Company - Consists of 4 platoons with like equipment

Company/team - formed the same as battalion/task force (substitute platoons for companies)

APPENDIX C

Performance Assessment Tools and Methods

This Appendix documents how to assess MDT2-CAS procedures with two measurement tools and methods.

The first tool is a checklist titled "Targeted Acceptable Responses to Generated Events or Tasks" (TARGETS). TARGETS has two formats, one for missions that are pre-planned and one for immediate missions. They both are included here although only their first pages are different. The two formats are compatible with other mission sub-categories such as pre-planned scheduled and laser-guided weapons. Military experts in CAS generated the checklists and use them based on doctrinally correct training objectives (Appendix A).

The second tool lists criteria for experts to use in judging communication and coordination quality of performance. The tool is titled "Teamwork Observation Measures" (TOM). TOM has three parts that include each phase of a CAS mission: planning, CP, and attack.

Both the TARGETS and TOM assessment tools emphasize interactions among trainees and how well they integrate and execute CAS. This Appendix has the following major sections:

MDT2

Targeted Acceptable Responses to Generated Events or Tasks (TARGETS)

Controller/Trainer Name: _____

Date: _____

CAS Mission #: _____

Scenario   Offensive   Defensive

(circle one)

Mission Type   Pre-planned Pre-planned Immediate   Laser-Guided   Dumb

(circle all that apply)   Scheduled   On-Call   Weapons   Bombs

Name: _____ **Day:** Mon Tues Wed Thurs Fri   **CAS Mission#:** _____

PPOC - PLANNING PHASE

FSO, working with ALO, S3, S2, develops CAS target priorities	

FSO generates a list of CAS targets	
▶ consistent with IPB	
▶ represent HPT/HVT	
▶ Key on engagement areas	
▶ manageable in number (3-5)	
▶ input obtained from ALO	
▶ Key targets provided in scenario considered	

Rate Selection of CAS targets:

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Indirect fires planned simultaneously with CAS	
Direct fires planned simultaneously with CAS	
SEAD planned	
FSO designates an ACA __ Formal __Informal (If informal, complete insert)	
▶ ALO provides input on aircraft requirements	
▶ ACA provides protection of fighters	
▶ ACA does not unduly restrict fires	
An alternate ACA is considered or planned	

Rate quality of ACA (consider informal ACA data):

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

FSO, S3, ALO conduct fire support/CAS rehearsal	
▶ responsibilities established	
▶ time lines. trigger events established	
▶ Fire Support Plan modified based on rehearsal	

Rate preparation to synchronize CAS and arty (consider all items in blue and Informal ACA insert as necessary):

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

ALO determines who will control the air attack	
ALO identifies a back-up controller	
FSO determines primary and alternate target marking methods	
ALO informed of target marking method	
FSO establishes recognition symbols, marking observable from air, consistent with OPSEC procedures	
Laser team position confirmed	
Laser team passes laser codes to FAC/ALO	
Essential information passed to final controller	
▶ frequencies	
▶ call signs	
▶ target type; location	
▶ location of friendlies	
▶ ACA	
▶ fire plan	
▶ expected TOT	
Essential information passed to back-up final crtlr	
FAC reports to ALO (e.g., enemy ADA, when target in sight, change in target status)	

Rate preparation of team to control CAS mission:

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Comments:

CODING for observation items: ✔ = Observed/performed satisfactorily; 0 = Omitted by team/failed to perform satisfactorily; ✗ = No opportunity to perform/not required

INFORMAL ACA INSERT

Location of Targets Planned for CAS and Artillery		Type Separation Planned						
Adjacent	[ ]	Lateral	[ ]	Altitude (shaded)		Timed (shaded)		
Same target, arty fires at low angle	[ ]	Lateral (shaded)		Altitude	[ ]	Timed (shaded)		
Same target	[ ]	Lateral (shaded)		Altitude (shaded)		Timed	[ ]	
Close, Adjacent (AAA suppression when CAS target is between artillery and anti-aircraft positions)	[ ]	Lateral	[ ]	Altitude	[ ]	Timed (shaded)		
Other (describe)	[ ]	Lateral	[ ]	Altitude	[ ]	Timed	[ ]	
Rate choice of separation plan: 1 Needs Work 2 Satisfactory 3 Very Good 4 Outstanding								

Action — **Score for selected column(s)** (Use code below)

Action	Lateral	Altitude	Timed
Gun-target line provided to FAC			
ALO provides input on determination of ACA (i.e., aircraft requirements)			
CAS/fire support rehearsal performed			
In plan: ACA provides adequate protection of fighters (e.g., do not fly over enemy or friendly arty)			
In plan: ACA provides adequate maneuverability			
In plan: Supporting fires are not unduly restricted			
Rehearsal used to update fire synchronization matrix (as required)			
No changes in artillery trajectory planned	(shaded)		(shaded)
No overflight of gun target line planned, except at impact point	(shaded)		(shaded)
Restricted final attack headings imposed	(shaded)		(shaded)
No shifting of fires planned	(shaded)	(shaded)	
Time intervals, radio calls, lost comm procedures developed to stop artillery fires	(shaded)	(shaded)	
Heading limitations avoid the gun lines	(shaded)	(shaded)	

Comments:

CODING for observation items: ✔ = Observed/performed satisfactorily; 0 = Omitted by team/failed to perform satisfactorily; ✗ = No opportunity to perform/not required

C-4

CP PHASE

Fighter authenticates		**HEAVY ENEMY ARTY**	
Fighter provides brief to FAC		Fighters informed of situation	
▸ Mission number		Fighters told to orbit at safe location	
▸ Number/type of aircraft		Fighter play time considered	
▸ Ordnance		Informal ACA established/re-established	
▸ Time on station		Alternate ACA considered	
▸ Abort code		ACA ▸ Protects fighters	
9-line provided to fighters		▸ Allows fighter maneuverability	
▸ IP		▸ FSO ensures indirect fires conform to ACA	
▸ Heading (IP to target)		▸ Clearly defined (e.g., suitable landmarks identified)	
▸ Distance (IP to target)		TOT revised	
▸ Target description		Availability of SEAD established	
▸ Type mark, laser code, target line		FSO established that SEAD can comply with TOT	
▸ Friendly location		Fighters briefed ▸ ACA clearly communicated	
▸ Egress directions		▸ TOT communicated	
▸ Remarks: SEAD, ACA clearly described, etc.		**Rate timeliness of response to enemy arty:** **1** **2** **3** **4** **Needs Work Satisfactory Very Good Outstanding**	
▸ TOT/TTT			
TTT/TOT retransmitted by fighter to acknowledge			
Fighter brief passed to MULE team		**Rate effectiveness of revised plan:** **1** **2** **3** **4** **Needs Work Satisfactory Very Good Outstanding**	
TOT passed to FSO			

Comments:

CODING for observation items: ✔ = Observed/performed satisfactorily; 0 = Omitted by team/failed to perform satisfactorily; ✗ = No opportunity to perform/not required

C-5

ATTACK PHASE

Attack clearance provided by FSO through ALO/FAC	
Fighters acknowledge by reporting TOT	
Fighters establish comm with laser designation team	
FSO directs time hacks ▸ SEAD	
▸ Indirect fires	
▸ Direct fires	
▸ WP	
DEPARTING IP call	
Fighters report friendly location	
Fighters cleared hot or mission aborted	
FAC describes target in relation to WP	
Standard calls provided ▸ 10 SECONDS	
▸ LASER ON or LASER ON __ SEC	
▸ SPOT	
▸ SHIFT (as necessary)	
▸ TERMINATE	
FAC reports BDA to fighters	
Fighters report PIR to FAC	

COMMO LOSS	
ALO/ETAC/FAC/ fighters contact final controller	

BACK-UP FINAL CONTROLLER PREVIOUSLY IDENTIFIED	
Back-up controller monitoring CAS mission	
CAS mission immediately assumed by back-up final controller	

NO BACK-UP FINAL CONTROLLER PREVIOUSLY IDENTIFIED	
Fighters contacted, given instructions	
Back-up controller identified	
▸ In position to observe	
▸ FIST considered	
▸ GFAC (MULE team) considered	
Back-up controller briefed (e.g., ordnance, status of aircraft, target)	

Rate selection of back-up controller:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Back-up controller establishes comms with fighters	
Back-up controller establishes. comms with FSO	
Who assumed control of mission?	

Rate timeliness of adjustment to commo loss given conditions at time of loss:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Rate effectiveness of control of CAS aircraft:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Comments:

REATTACK					
PASS	1	2	3	4	5
RESULT	D W A	D W A	D W A	D W A	D W A

D = Dry; W = Wet; A = Abort

MISSION ABORTED	
Abort code used/aborted IAW SOP	
Reason for abort:	

CODING for observation items: ✔ = Observed/performed satisfactorily; 0 = Omitted by team/failed to perform satisfactorily; ✗ = No opportunity to perform/not required

C-6

Name: _____ Day: Mon Tues Wed Thurs Fri   CAS Mission#: _____

IMMEDIATE - PLANNING PHASE

Immediate CAS target identified	

FSO/ALO recommend approval/disapproval of CAS mission considering factors such as: ▸ target type ▸ capabilities of organic weapons ▸ CAS availability ▸ time factors ▸ enemy ADA ▸ target acquisition limitations and capabilities ▸ target area weather	

Rate decision to use immediate CAS:

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

ALO passes CAS request to ASOC	
Indirect fires planned simultaneously with CAS	
Direct fires planned simultaneously with CAS	
SEAD planned	
FSO designates an ACA __ Formal __Informal (If informal, complete insert)	
▸ ALO provides input on aircraft requirements	
▸ ACA provides protection of fighters	
▸ ACA does not unduly restrict fires	
An alternate ACA is considered or planned	

Rate quality of ACA (consider informal ACA data):

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

FSO, S3, ALO conduct fire support/CAS rehearsal	
▸ responsibilities established	
▸ time lines. trigger events established	
▸ Fire Support Plan modified based on rehearsal	

Rate preparation to synchronize CAS and arty (consider all items in blue and Informal ACA insert as necessary):

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Comments:

ALO determines who will control the air attack	
ALO identifies a back-up controller	
FSO determines primary and alternate target marking methods	
ALO informed of target marking method	
FSO establishes recognition symbols	
Laser team position confirmed	
Laser team passes laser codes to FAC/ALO	
Essential information passed to final controller	
▸ frequencies	
▸ call signs	
▸ target type. location	
▸ location of friendlies	
▸ ACA	
▸ fire plan	
▸ expected TOT	
Essential mission information passed to back-up final controller	
FAC reports to ALO (e.g., enemy ADA, when target in sight, change in target status)	
Once CAS mission approved; mission data relayed to final controller: ▸ mission number ▸ fighter call sign ▸ number and type of aircraft ▸ TOT ▸ communication frequencies	
Mission data relayed to back-up final controller	

Rate preparation of team to control CAS mission:

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

INFORMAL ACA INSERT

Location of Targets Planned for CAS and Artillery

Location	
Adjacent	
Same target, arty fires at low angle	
Same target	
Close, Adjacent (AAA suppression when CAS target is between artillery and anti-aircraft positions)	
Other (describe)	

Type Separation Planned

Lateral	Altitude (shaded)		Timed (shaded)
Lateral (shaded)	Altitude		Timed (shaded)
Lateral (shaded)	Altitude (shaded)		Timed
Lateral	Altitude		Timed (shaded)
Lateral	Altitude		Timed

Rate choice of separation plan:

1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Action

Score for selected column(s)
(Use code below)

Action	Lateral	Altitude	Timed
Gun-target line provided to FAC			
ALO provides input on determination of ACA (i.e., aircraft requirements)			
CAS/fire support rehearsal performed			
In plan: ACA provides adequate protection of fighters (e.g., do not fly over enemy or friendly arty)			
In plan: ACA provides adequate maneuverability			
In plan: Supporting fires are not unduly restricted			
Rehearsal used to update fire synchronization matrix (as required)			
No changes in artillery trajectory planned	(shaded)		(shaded)
No overflight of gun target line planned, except at impact point	(shaded)		(shaded)
Restricted final attack headings imposed	(shaded)		(shaded)
No shifting of fires planned	(shaded)	(shaded)	
Time intervals, radio calls, lost comm procedures developed to stop artillery fires	(shaded)	(shaded)	
Heading limitations avoid the gun lines	(shaded)	(shaded)	

Comments:

CP PHASE

Fighter authenticates		HEAVY ENEMY ARTY	
Fighter provides brief to FAC		Fighters informed of situation	
► Mission number		Fighters told to orbit at safe location	
► Number/type of aircraft		Fighter play time considered	
► Ordnance		Informal ACA established/re-established	
► Time on station		Alternate ACA considered	
► Abort code		ACA ► Protects fighters	
9-line provided to fighters		► Allows fighter maneuverability	
► IP		► FSO ensures indirect fires conform to ACA	
► Heading (IP to target)		► Clearly defined (e.g., suitable landmarks identified)	
► Distance (IP to target)		TOT revised	
► Target description		Availability of SEAD established	
► Type mark, laser code, target line		FSO established that SEAD can comply with TOT	
► Friendly location		Fighters briefed ► ACA clearly communicated	
► Egress directions		► TOT communicated	
► Remarks: SEAD, ACA clearly described, etc.		**Rate timeliness of response to enemy arty:** 1 2 3 4 **Needs Work Satisfactory Very Good Outstanding**	
► TOT/TTT			
TTT/TOT retransmitted by fighter to acknowledge			
Fighter brief passed to MULE team		**Rate effectiveness of revised plan:** 1 2 3 4 **Needs Work Satisfactory Very Good Outstanding**	
TOT passed to FSO			

Comments:

ATTACK PHASE

Attack clearance provided by FSO through ALO/FAC	
Fighters acknowledge by reporting TOT	
Fighters establish comm with laser designation team	
FSO directs time hacks ► SEAD	
► Indirect fires	
► Direct fires	
► WP	
DEPARTING IP call	
Fighters report friendly location	
Fighters cleared hot or mission aborted	
FAC describes target in relation to WP	
Standard calls provided ► 10 SECONDS	
► LASER ON or LASER ON __ SEC	
► SPOT	
► SHIFT (as necessary)	
► TERMINATE	
FAC reports BDA to fighters	
Fighters report PIR to FAC	

REATTACK					
PASS	1	2	3	4	5
RESULT	D W A	D W A	D W A	D W A	D W A
D = Dry; W = Wet; A = Abort					

MISSION ABORTED	
Abort code used/aborted IAW SOP Reason for abort:	

COMMO LOSS	
ALO/ETAC/FAC/ fighters contact final controller	

BACK-UP FINAL CONTROLLER PREVIOUSLY IDENTIFIED	
Back-up controller monitoring CAS mission	
CAS mission immediately assumed by back-up final controller	

NO BACK-UP FINAL CONTROLLER PREVIOUSLY IDENTIFIED	
Fighters contacted, given instructions	
Back-up controller identified	
► In position to observe	
► FIST considered	
► GFAC (MULE team) considered	
Back-up controller briefed (e.g., ordnance, status of aircraft, target)	

Rate selection of back-up controller:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Back-up controller establishes comms with fighters	
Back-up controller establishes comms with FSO	
Who assumed control of mission?	

Rate timeliness of adjustment to commo loss given conditions at time of loss:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Rate effectiveness of control of CAS aircraft:			
1	2	3	4
Needs Work	Satisfactory	Very Good	Outstanding

Comments:

MDT2

Teamwork Observation Measure
(TOM)

Your Name: _____

Day: Mon   Tues   Wed   Thurs   Fri
                              (circle one)

Your Location: Ft.   Pax   Mesa: Mesa:
                      Knox   River   Pilots   DFO/MULE
                                   (circle one)

Instructions

The pages in this packet will be used to assess team performance on each of the CAS missions in today's battle. The first section should be used for assessing team performance during the PLANNING PHASE of the battle. This section is followed by 3 color-coded sections--1 for each of 3 separate CAS missions. Each of the color-coded sections contains 2 pages. The first page in each section is to be used for assessing team performance during the CP PHASE of the mission, and the second page is for assessing team performance during the ATTACK PHASE of the mission. The 3 phases are defined on the next page.

For each phase--Planning, CP, and Attack--there are 4 dimensions of team performance that you should assess: Communication, Team Coordination, Situational Awareness, and Team Adaptability. These dimensions, which are defined on the next page, are listed on the left side of each assessment page.

Each of the 4 dimensions of teamwork is made up of several components. For example, Communication is made up of components such as "used correct format", "used proper terminology", etc. These components are listed in the center column of each assessment page. You should consider how well the team demonstrated these components as you observe the team's communications. Similarly, you should consider the components that make up the other dimensions.

During each phase, you should make notes in the appropriate spaces (i.e., the center column). Your notes will be used to help focus the AAR on the INTERACTIONS THAT OCCURRED BETWEEN THE SERVICES, rather than on the interactions that occurred within a specific service. Also, your notes should concentrate on specific examples of very strong performance and on specific examples of very weak performance. Remember, these notes will be used as learning points to be raised during the AAR.

Finally, in the far right column of each page, rate how well the listed players performed on each dimension. The ratings range from "1" (Needs Work), to "4" (Outstanding). NA means Not Applicable. Again, focus your ratings on the INTERACTIONS THAT OCCUR BETWEEN PLAYERS FROM THE DIFFERENT SERVICES rather than on players within a specific service. Please complete the assessment sheets as the scenario is running, rather than waiting until the end!

2

Definitions

Phases:

The <u>PLANNING PHASE</u> refers to the planning that is done before the scenario actually starts, continues through STARTEX, and lasts until the aircraft arrive at the CP.

The <u>CP PHASE</u> begins when the aircraft arrive at the CP and lasts until the aircraft depart the CP.

The <u>ATTACK PHASE</u> starts when the aircraft depart the CP and lasts until the aircraft egress the area.

Dimensions:

<u>COMMUNICATION</u> involves the exchange of information between 2 or more team members in a prescribed manner, using **correct format** and **proper terminology**. Communications should be **clear**, **concise**, and **accurate**. **Acknowledgment** of communications is also critical.

<u>COORDINATION</u> refers to team members' executing the tasks in an integrated, cohesive, and timely manner. Critical factors include **synchronization of actions, timely passing of information,** and **familiarity with others' job needs.**

<u>SITUATIONAL AWARENESS</u> refers to the ability to develop and maintain an accurate perception of the surrounding environment. This includes **maintaining the big picture, identifying potential problem areas in advance, being aware of the resources available**, and **providing information before it is needed**.

<u>ADAPTABILITY</u> refers to the team's ability to effectively and efficiently maintain task performance despite changes that may occur during the mission. A team's adaptability is evidenced by the members ability to **have back up plans available, making smooth transitions to back up plans**, and **quickly adjusting to situational changes**.

3

Planning Phase

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE <u>Communications</u> that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA
	Clear/Concise/Accurate:	FSO: 1 2 3 4 NA
		Air FAC: 1 2 3 4 NA
	Acknowledgments:	MULE: 1 2 3 4 NA
		Pilots: 1 2 3 4 NA
	Other:	Cmdr/Staff: 1 2 3 4 NA

Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE <u>Coordination</u> that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA

Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE <u>Situational Awareness</u> that involved the following players.
	Identified Potential Problem Areas:	ALO/ETAC: 1 2 3 4 NA
	Aware of Resources Available:	FSO: 1 2 3 4 NA
		Air FAC: 1 2 3 4 NA
	Provided Info in Advance:	MULE: 1 2 3 4 NA
		Pilots: 1 2 3 4 NA
	Other:	Cmdr/Staff: 1 2 3 4 NA

Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE <u>Adaptability</u> that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA

4

CP Phase

Mission # 1

Needs Work	Satis-factory	Very Good	Out standing	
1	2	3	4	NA

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE Communications that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA
	Clear/Concise/Accurate:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Acknowledgments:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE Coordination that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE Situational Awareness that involved the following players.
	Identified Potential Problem Areas:	ALO/ETAC: 1 2 3 4 NA
	Aware of Resources Available:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Provided Info in Advance:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE Adaptability that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

5

Attack Phase

Mission # 1

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE <u>Communications</u> that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA
	Clear/Concise/Accurate:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA
	Acknowledgments:	MULE: 1 2 3 4 NA Pilots: 1 2 3 4 NA
	Other:	Cmdr/Staff: 1 2 3 4 NA
Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE <u>Coordination</u> that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE <u>Situational Awareness</u> that involved the following players.
	Identified Potential Problem Areas:	
	Aware of Resources Available:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA
	Provided Info in Advance:	MULE: 1 2 3 4 NA Pilots: 1 2 3 4 NA
	Other:	Cmdr/Staff: 1 2 3 4 NA
Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE <u>Adaptability</u> that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

6

Needs Work	Satis- factory	Very Good	Out- standing	
1	2	3	4	NA

Notes:

Communication

Correct Format:	
Proper Terminology:	
Clear/Concise/Accurate:	
Acknowledgments:	
Other:	

Rate the INTER-SERVICE <u>Communications</u> that involved the following players.

ALO/ETAC:	1	2	3	4	NA
FSO:	1	2	3	4	NA
Air FAC:	1	2	3	4	NA
MULE:	1	2	3	4	NA
Pilots:	1	2	3	4	NA
Cmdr/Staff:	1	2	3	4	NA

Team Coordination

Synchronized Actions:	
Timely Passing of Info:	
Familiar w/ Others' Jobs:	
Other:	

Rate the INTER-SERVICE <u>Coordination</u> that involved the following players.

ALO/ETAC:	1	2	3	4	NA
FSO:	1	2	3	4	NA
Air FAC:	1	2	3	4	NA
MULE:	1	2	3	4	NA
Pilots:	1	2	3	4	NA
Cmdr/Staff:	1	2	3	4	NA

Situational Awareness

Maintained "Big Picture":	
Identified Potential Problem Areas:	
Aware of Resources Available:	
Provided Info in Advance:	
Other:	

Rate the INTER-SERVICE <u>Situational Awareness</u> that involved the following players.

ALO/ETAC:	1	2	3	4	NA
FSO:	1	2	3	4	NA
Air FAC:	1	2	3	4	NA
MULE:	1	2	3	4	NA
Pilots:	1	2	3	4	NA
Cmdr/Staff:	1	2	3	4	NA

Team Adaptability

Back Up Plans:	
Smooth Transition to Back Up Plans:	
Quickly Adjusted to Situational Changes:	
Other:	

Rate the INTER-SERVICE <u>Adaptability</u> that involved the following players.

ALO/ETAC:	1	2	3	4	NA
FSO:	1	2	3	4	NA
Air FAC:	1	2	3	4	NA
MULE:	1	2	3	4	NA
Pilots:	1	2	3	4	NA
Cmdr/Staff:	1	2	3	4	NA

7

Attack Phase

Mission # 2

Needs Work	Satis- factory	Very Good	Out- standing	
1	2	3	4	NA

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE Communications that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA
	Clear/Concise/Accurate:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Acknowledgments:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE Coordination that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE Situational Awareness that involved the following players.
	Identified Potential Problem Areas:	ALO/ETAC: 1 2 3 4 NA
	Aware of Resources Available:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA
	Provided Info in Advance:	MULE: 1 2 3 4 NA Pilots: 1 2 3 4 NA
	Other:	Cmdr/Staff: 1 2 3 4 NA

Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE Adaptability that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	FSO: 1 2 3 4 NA Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

8

CP Phase

Mission # 3

Needs Work	Satis-factory	Very Good	Out-standing	
1	2	3	4	NA

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE <u>Communications</u> that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Clear/Concise/Accurate:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Acknowledgments:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE <u>Coordination</u> that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE <u>Situational Awareness</u> that involved the following players.
	Identified Potential Problem Areas:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Aware of Resources Available:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Provided Info in Advance:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE <u>Adaptability</u> that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA FSO: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	Air FAC: 1 2 3 4 NA MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA Cmdr/Staff: 1 2 3 4 NA

9

Attack Phase   # Mission # 3

Notes:

Communication	Correct Format:	Rate the INTER-SERVICE Communications that involved the following players.
	Proper Terminology:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Clear/Concise/Accurate:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Acknowledgments:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Coordination	Synchronized Actions:	Rate the INTER-SERVICE Coordination that involved the following players.
	Timely Passing of Info:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Familiar w/ Others' Jobs:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA

Situational Awareness	Maintained "Big Picture":	Rate the INTER-SERVICE Situational Awareness that involved the following players.
	Identified Potential Problem Areas:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Aware of Resources Available:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Provided Info in Advance:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA
	Other:	

Team Adaptability	Back Up Plans:	Rate the INTER-SERVICE Adaptability that involved the following players.
	Smooth Transition to Back Up Plans:	ALO/ETAC: 1 2 3 4 NA
		FSO: 1 2 3 4 NA
	Quickly Adjusted to Situational Changes:	Air FAC: 1 2 3 4 NA
		MULE: 1 2 3 4 NA
	Other:	Pilots: 1 2 3 4 NA
		Cmdr/Staff: 1 2 3 4 NA

10

APPENDIX D

Outcome Measures and Displays

This appendix describes how to use SIMNET and DIS data for feedback in CAS training. The description is about displays that employ data from DIS protocols processed into combat summaries using SIMNET and the Unit Performance Assessment (UPAS) System.

Background

AARs for multi-Service CAS used input from the distributed training sites: Fort Knox, KY, Mesa, AZ, and Patuxant River, MD. O/Cs at these sites saw and assessed CAS performance from different perspectives: the ground components and laser designator, the pilots, and the airborne FAC. O/Cs at Fort Knox and other sites communicated using telephone and FAX in order to compile and integrate information for the multi-Service AAR. UPAS supported these multi-Service AARs by processing Protocol Data Units (PDUs) to produce summary displays of combat for feedback to trainees.

The Fort Knox site used data displays based on SIMNET protocols, including DIS PDUs translated into SIMNET PDUs. The translator was necessary because simulators at Fort Knox were using the SIMNET 6.61 protocols while simulators at other sites were using DIS 2.03 protocols. The UPAS was used to analyze the SIMNET PDU stream in the secure Fort Knox Mounted Warfare Test Bed. To support further analyses of MDT2 data at non-secure offices, the only data taken from the test site were in relational data tables from which all sensitive aircraft data had been removed. This step restricted data analysis opportunities, but using the UPAS to analyze classified data outside the MDT2 was not a viable option.

At least two types of DIS PDUs were not translated into SIMNET: laser PDUs and event report PDUs. The laser PDU did not need to be translated into SIMNET because it was not used as part of a simulation by any of the SIMNET entities. Further, information needed for data analysis from the DIS laser PDU was obtained from DIS sites. The event report PDU contained one type of information -- entity damage, destruction, and reincarnation -- that was roughly equivalent to a SIMNET Status Change PDU and other types of information that had no equivalent PDU in SIMNET (e.g., the time a behavioral event occurred). There was no capability at Fort Knox to collect and examine DIS PDUs, other than those translated into SIMNET because the UPAS in use was not DIS compliant.

UPAS Hardware and Software Requirements

UPAS is government-owned software that runs on an IBM AT or compatible computer with a VGA adapter and monitor. Due to the need to process information quickly after an exercise, it is recommended that UPAS be employed on a 486 or higher system running at a minimum of 50 megahertz. The system must also have a minimum of four megabytes of RAM. The system should include a 350 megabyte, or higher, hard disk. The ETHERNET board used to connect the UPAS to a SIMNET network must be a 3COM Board 503. Any printer that supports the Epson MX, Epson FX, Epson LQ, Hewlett Packard LaserJet, or Hewlett Packard Ink Jet Interfaces can be used.

The UPAS employs the XDB relational database management system from XDB System, Inc. (Address: 7309 Baltimore Avenue, College Park, Maryland 20740; Telephone: 301-779-6030). The UPAS is designed to run with the XDB DBMS Version 2.40 with the XDB-XM option.

After Action Review (AAR) Displays

UPAS displays were appropriate only for feedback about a small subset of the 25 multi-Service objectives for CAS training. Many of the objectives involved combat activities not represented by PDUs. For example, the following relationship existed between network data displays and CAS objectives:

- Seventeen of the objectives addressed communications among players rather than behaviors recorded by PDUs.

- One objective (control CAS air attack) relied on network data best obtained from DIS (not SIMNET) PDUs.

Displays based on SIMNET PDUs primarily were practical for five objectives identified in MDT2 as "4, 19, 23, 24, 25" which correspond to the list of 25 (Appendix A). These are highlighted by bold lettering in the list below. Each item in the list describes MDT2-CAS in terms of when displays were and were not used for feedback. SIMNET feedback tools included the Plan View and Stealth systems plus the Unit Performance Assessment System (UPAS).

Utility of Displays for AARs about MDT2-CAS Training Objectives

1. Determine battalion mission intent and concept of operations. SIMNET PDUs did not record planning.

2. Determine the enemy situation. SIMNET displays might be used to show enemy dispositions and actions for comparison with the S-2's intelligence estimate and probable enemy course of action. MDT2-CAS did not play the intelligence function and therefore did not have such displays.

3. Provide initial brief to pilots and controllers. SIMNET PDUs did not record communications.

4. Update airborne pilots as necessary. SIMNET displays can be used to describe changes in the tactical situation requiring updates to pilots.

5. Develop CAS target priorities. SIMNET PDUs did not record planning.

6. Develop priority of intelligence collection assets to detect CAS targets. The behavior/product is a plan for using assets to collect intelligence on CAS targets, and SIMNET PDUs did not record planning. However, the displays might be used to help decide if plans are followed and if they are adequate. (e.g., are data collection assets where they are supposed to be? Are critical targets left uncovered by data collection assets)?

7. Integrate CAS and other fire support elements with maneuver actions. SIMNET displays might be used to help assess execution of the fire support plan, but this is covered as part of objective "w."

8. Institute Fire Support control/coordination measures. The SIMNET displays might be used to help assess if control/coordination measures are followed.

9. Prioritize all CAS requests from subordinate commanders. SIMNET PDUs did not record data about priorities.

10. Initiate Airspace Coordination Areas (ACA). This is a planning activity and SIMNET PDUs did not record these data. The quality and execution of ACAs might be examined with displays for objective " w."

11. Conduct a fire support/CAS rehearsal. A rehearsal can be examined using SIMNET displays only if simulators are used in the rehearsal. At best, only small portions of the rehearsals are likely to involve the use of simulators.

12. Prepare a decision synchronization matrix. This skill is not supported directly by SIMNET PDUs.

13. Establish methods to identify targets during CAS operations. SIMNET PDUs record some methods for marking targets (artillery) but not others (voice commands). Applications of these displays are scenario and exercise dependent.

14. Establish methods to identify friendly troops during CAS operations. SIMNET displays can show related information: the location of friendly elements on the battlefield when there is a discrepancy between the reported and actual location of these targets; whether fratricides occurred during a mission.

15. Incorporate SEAD in the fire plan. The UPAS Firefight Display (see objective "23") can be used to examine/illustrate if and when direct and indirect fires are used on actual or suspected enemy air defense locations. If enemy air defense is played, then UPAS data tables may help determine when friendly aircraft are destroyed by enemy air defense.

16. Pass preplanned CAS targets to higher headquarters. This objective requires communication data not recorded by SIMNET PDUs.

17. Pass immediate targets and on-call target updates to higher headquarters. This objective requires communication data not recorded by SIMNET PDUs.

18. Control CAS air attack. Control is done primarily with communications not recorded by SIMNET PDUs. SIMNET Plan View displays may illustrate the outcome of the CAS attack and events leading up to it.

19. Protect laser team. SIMNET displays can provide data about whether forward deployed units have line-of-sight with the laser team, when the laser team has enemy fire in its vicinity or becomes a casualty, and whether the remainder of the unit uses suppressive fires on the enemy to protect the laser team. SIMNET displays also can show the cover and concealment offered by positions.

20. Perform communications check among all fire support and CAS participants. This objective requires communication data not recorded by SIMNET PDUs.

21. Confirm status of friendly air defense. Friendly air defense was not played in MDT2-CAS. Further, this objective largely is a radio or telephone communications activity not recorded by SIMNET PDUs.

22. Arrive on station and establish initial communications. SIMNET displays can be used to show when aircraft arrive on station, and they can be used to show the location

23. Synchronize CAS attack with other direct and indirect fires. The UPAS can provide displays for assessing fire coordination by showing the timing, location, and volume of different types of firing events, including the use of minefields or obstacles. Figure 1 illustrates a UPAS Fire Fight Display with rectangles for artillery impacts. The period of time covered by the display is user selectable and can show the location of artillery impacts immediately prior to a CAS mission, during a CAS mission, or immediately after a CAS mission. These displays can be used to assess if artillery is being used on the target prior to the CAS mission, if these fires are shifted or lifted during the CAS mission, and if the fires are again used on the target after the CAS mission.
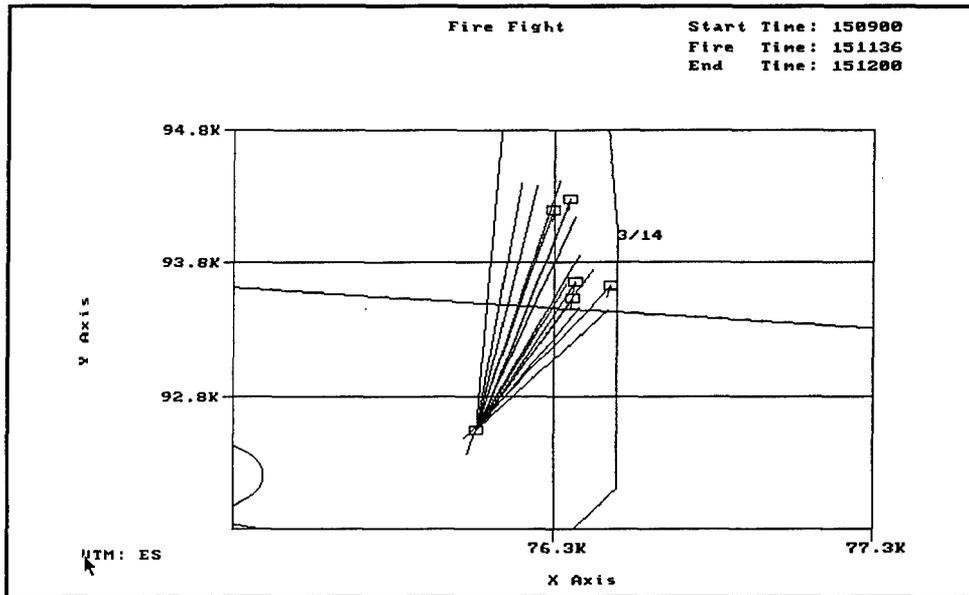
Figure 1. Fire Fight display showing locations of direct fire shot lines before, during, or after CAS missions.

The UPAS Fire Fight display also can show where fires focus before, during, and after CAS missions (see Figure 2). Related graphs of fires by ammunition (or weapon system type) can be used to integrate information about different platforms. Figure 3 shows a graph with the timing and volume of artillery fires and CAS bombs.
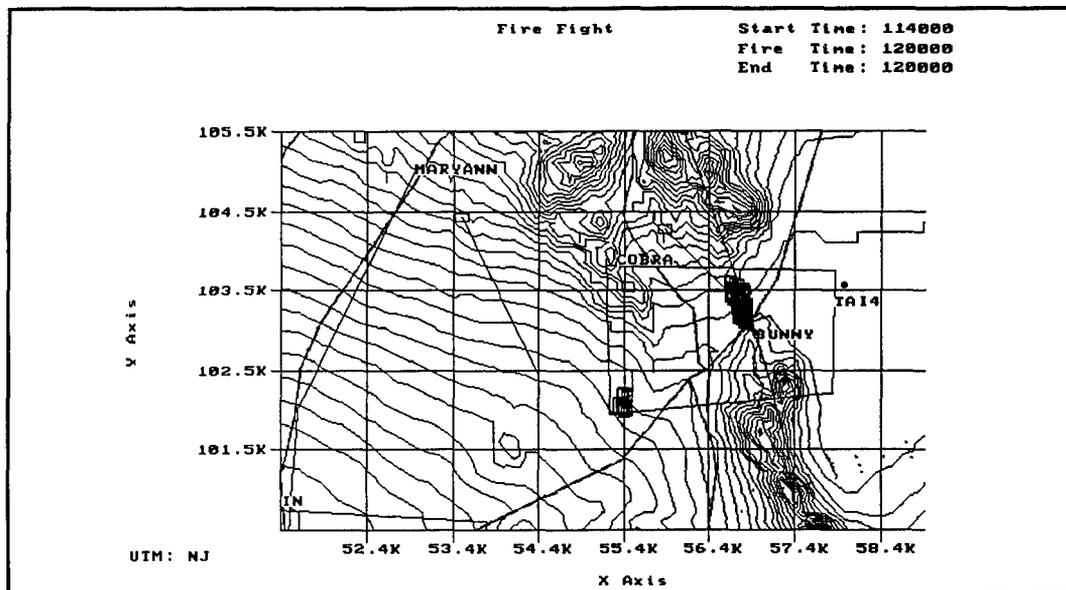
Figure 2. Use of UPAS Fire Fight to show artillery impacts for time period before, during, or after a CAS mission.
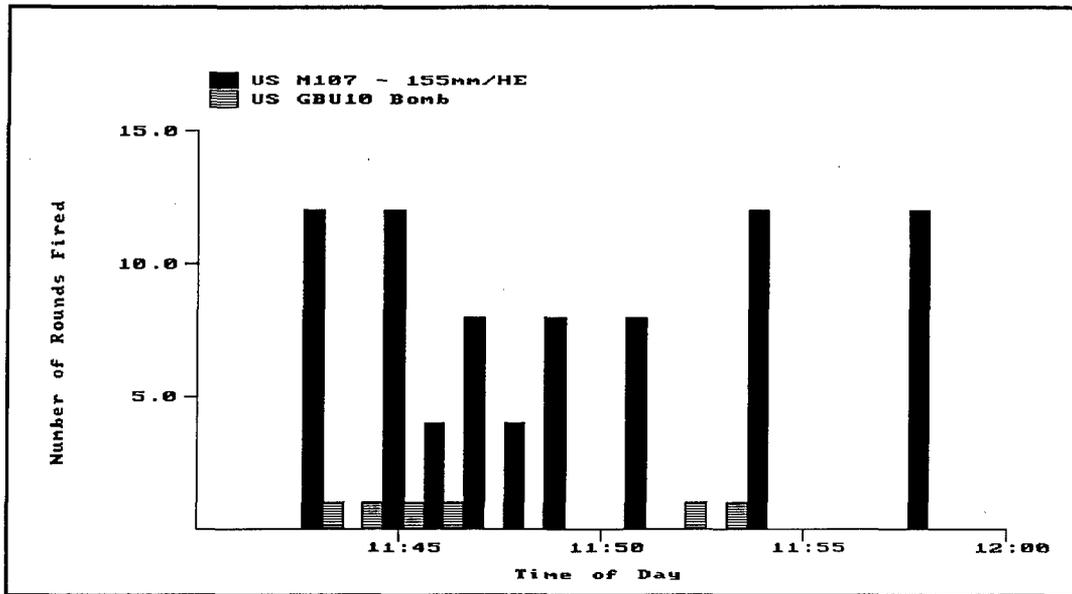
Figure 3. The timing and volume of two types of fire: artillery and CAS GBU10 bombs.

24. Conduct CAS attack. Information about laser designator use was available from DIS sites only because SIMNET did not translate the laser data. However, SIMNET displays can be used to assess and illustrate if and when the mission is aborted, munitions fall on (or in the vicinity of) friendly elements, or the munitions fall on (or in the vicinity of) enemy elements. Finally SIMNET displays can be used to depict battle damage (Figure 4).
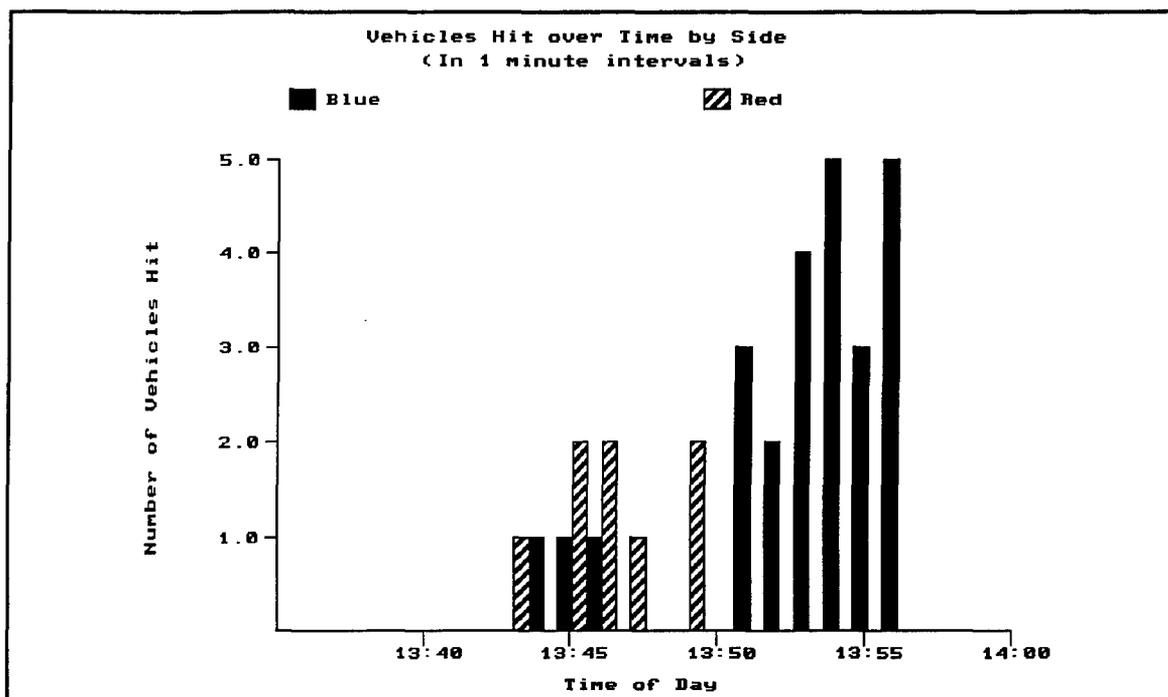
Figure 4. Destruction of forces by each side as a function of time.

25. Return from and assess CAS mission. Data about whether aircraft depart through the proper ACA and arrive at various control measures on time are available from overhead views of the action using a SIMNET Plan View, the UPAS Plan View, and the UPAS Snapshot. The UPAS also documents actual vs. reported damage as described under paragraph "24."

APPENDIX E
MDT2 NETWORK AND SIMULATORS

This appendix describes the distributed simulation network used for MDT2. This network allowed warfighters from different sites to use their simulators as part of a joint synthetic battlespace. Implementing this battlespace required virtual simulators from geographically separate sites to exchange simulation and voice data as part of a real-time network. Detailed descriptions of each simulation site's hardware, software, and functional capabilities would require multiple volumes. Because intersite communication was the overriding technical driver for MDT2, this appendix focuses on the communication architecture and communication protocols used for MDT2. It assumes readers are familiar with the technologies underlying real-time virtual simulation and Distributed Interactive Simulation. Therefore, details concerning individual sites or simulators are presented only if those details are necessary to clarify the activities involved in establishing the MDT2 simulation network.

This appendix is organized as shown below:

Table of Contents

List of Tables

List of Figures

1.   MDT2 System Requirements

The MDT2 team established the following functional requirements for the design, development, and implementation of the simulation network:

- Technical solutions had to be consistent with the training, data collection, and training research goals of MDT2.

- MDT2 had to use existing simulators. Although these simulators could be modified to support training requirements, cost and schedule precluded development of unique simulators.

- Because MDT2 used Close Air Support (CAS) as the primary training mission, the simulation network had to support critical tasks essential for such close combat.

- All simulation sites had to communicate with one another using DIS Standard 2.0 v 3 Protocol Data Units (PDUs).

- The DIS Laser PDU had to be modified so that a Laser Guided Bomb (LGB) simulation modeled in one simulator could realistically acquire and track the simulated laser spot generated from another simulator.

- Ground and air vehicle positions, velocity, orientation, and type had to be displayed based on Entity State PDUs received over the network.

- Weapon impacts had to be determined, battle damage calculated, and weapon effects appropriately displayed based on transmitted PDUs.

- Digital voice systems had to be used for all tactical communication among simulation sites so that both simulation data and voice data could be transmitted using DIS PDUs and digitally recorded.

- Terrain databases had to be sufficiently correlated between sites so that all participants could interact with one another as part of a common virtual world.

- Communication channels had to be established to support mission planning, exercise control, and feedback for debriefs or after action reviews.

- The entire simulation network had to operate at the Secret/No Foreign (Secret/NOFORN) security classification level. Computer systems at both the Armstrong Laboratory, Aircrew Training Research Division (AL/HRA) and the Naval Air Warfare Center, Aircraft Division (NAWC/AD) contained software classified

Secret/NOFORN. Because of this, the entire MDT2 had to operate as a classified network.

Additional requirements were derived based on analysis of the training research requirements, each site's simulation capabilities, technical constraints, available resources, information from subject matter experts on the conduct of CAS, and lessons learned from previous distributed simulation projects. Based on these requirements, an interface requirement specification (IRS) and system test plan (STP) were prepared and distributed to each simulation site. The IRS defined the overall communication architecture. It also defined the information that would be communicated between sites and served as the primary means of coordinating development activities between the various MDT2 sites. The STP provided a mechanism to verify site interoperability.

2. Simulation Sites

The MDT2 simulation network linked systems located at the:

- Armstrong Laboratory Aircrew Training Research Division (AL/HRA), Mesa, Arizona.
- Institute for Defense Analyses (IDA), Alexandria, Virginia.
- Mounted Warfare Test Bed (MWTB), Ft. Knox, Kentucky.
- Naval Air Warfare Center/Aircraft Division (NAWC/AD), Patuxent River, Maryland.

Commercial T-1 communication lines and the Defense Simulation Internet (DSINet) connected these sites to form the MDT2 Wide Area Network (WAN). Figure 1 illustrates this WAN. Information was exchanged across this WAN using DIS Protocol, Version 2.0 Third Draft (DIS 2.03).
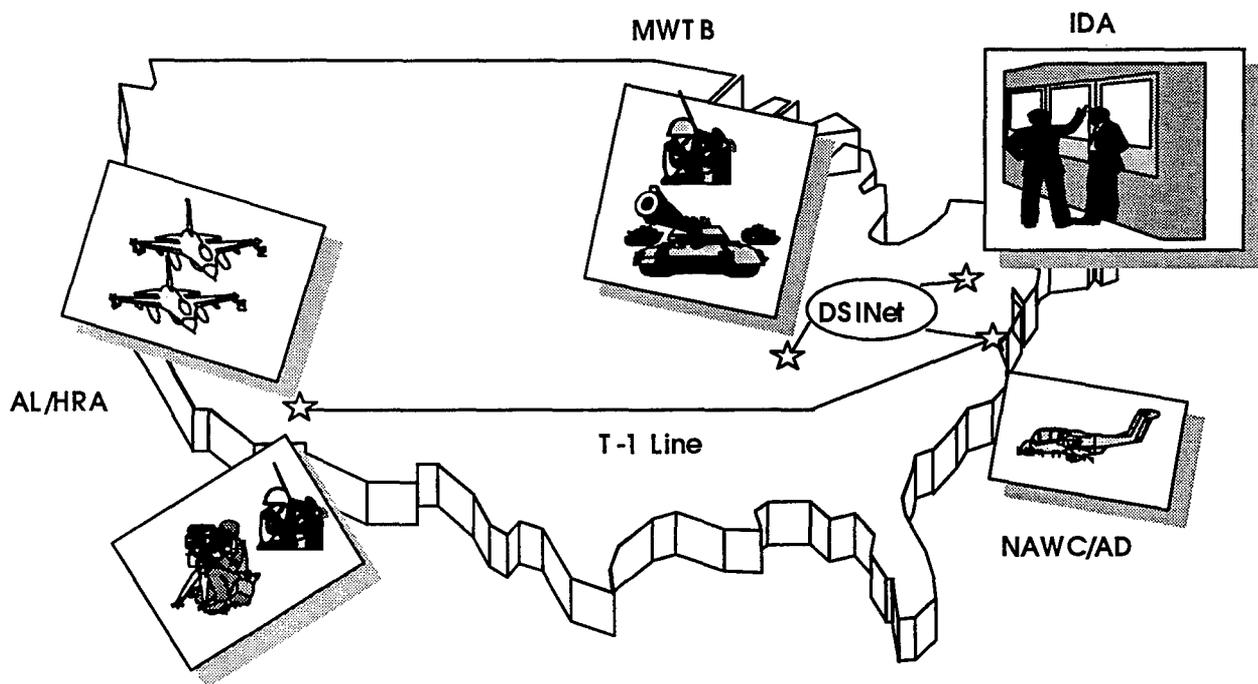

Figure 1. MDT2 Wide Area Network

This section lists the simulators used at each site and schematically illustrates the functional connectivity used for MDT2. Details concerning the communication architecture used to link the various simulation sites is presented in Section 4. Information concerning MDT2 voice communication and DIS protocols is presented in Sections 5 and 6, respectively.

Detailed discussion of the each site's specific simulation hardware and software components and their functional capabilities is beyond the scope of this appendix. In addition to different simulation components, each site used unique systems to support their local area network (LAN). Typical support systems included exercise control stations, instructor/operator stations, data capture workstations, tactical situation displays, network monitoring equipment,

and network interface units. These support systems were essential for the operation of each site's LAN and were designed specifically to meet each site's local simulation requirements. Because of the site- specific nature of these support systems, they also are not discussed in this appendix.

Armstrong Laboratory Aircrew Training Research Division. AL/HRA provided two F-16C Multitask Trainers (MTTs) and the Automated Threat Engagement System (ATES). The F-16C MTTs flew the CAS attacks while the ATES provided radar simulation to accompany the surface-to-air threat generated at the MWTB. This radar simulation provided emission PDUs to trigger the F-16C MTT radar warning receivers. In addition, the Deployed Forward Observer Modular Universal Laser Equipment (DFO-MULE) simulator was also located at AL/HRA[1]. These systems were interconnected on a LAN and communicated with each other using DIS 2.0 v 3. Figure 2 shows the AL/HRA network configuration used for MDT2.
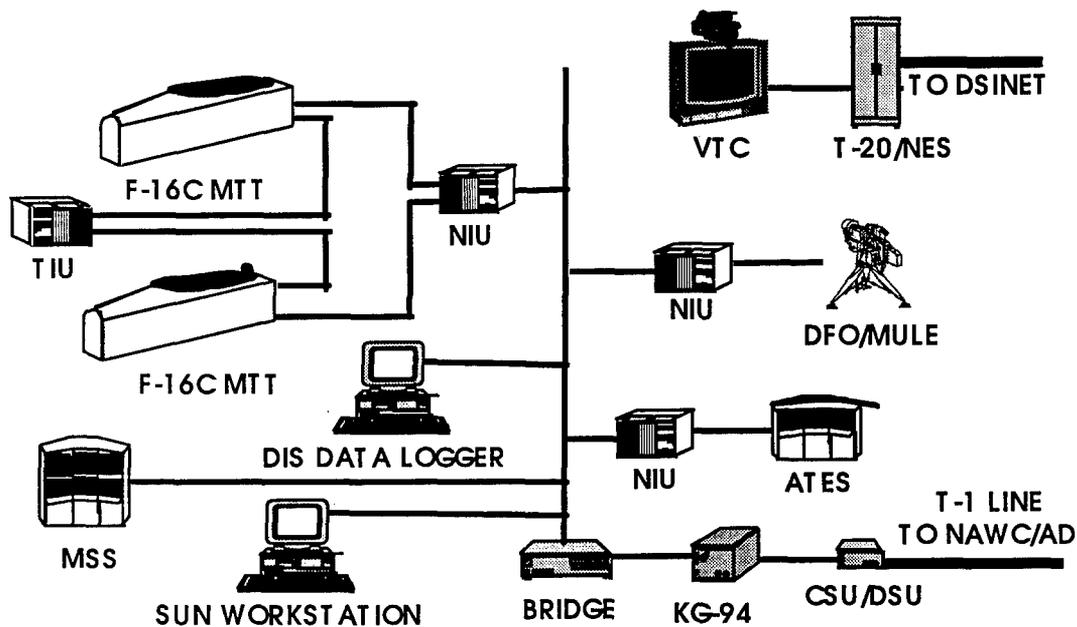

Figure 2. Armstrong Laboratory Configuration.

---

[1] During the first phase of MDT2, the Naval Air Warfare Center's Deployed Forward Observer, Modular Unit Laser Equipment (DFO-MULE) simulator was located at the Naval Research and Development Center (NRAD) in San Diego, CA. Because of conflicts with other research activities, the DFO-MULE was moved to Armstrong Laboratory for the second phase of MDT2. Since NRAD was a DSINet site, there were no significant differences between NRAD and MWTB or NAWC/AD connections to the DSINet Technical details concerning the integration of the DFO-MULE into either NRAD or AL/HRA's LAN are essentially identical.

For MDT2, the DFO-MULE simulator provided a means for the Tactical Air Controller-Ground (TAC-G) team to observe and identify ground targets and to mark their locations with mortar rounds. In addition, the DFO-MULE contained a simulated Laser Designator Rangefinder Module (LDRM). This LDRM allowed training laser-guided weapons delivery using a simulated laser designator. For MDT2, a Network Interface Unit (NIU) and DIS Digital Voice Unit were added to the DFO-MULE. The NIU performed the required data translations, dead reckoning, and data filtering necessary to connect a non-DIS simulator to the DIS 2.0.3 LAN.

Institute for Defense Analysis. IDA provided a means for observers to monitor MDT2 mission simulations from a simulation-independent site. IDA's Stealth and Plan View Display, combined with the DIS Digital Voice System provided a unique vantage point from which simulation events could be observed, communications monitored, and data streams recorded.
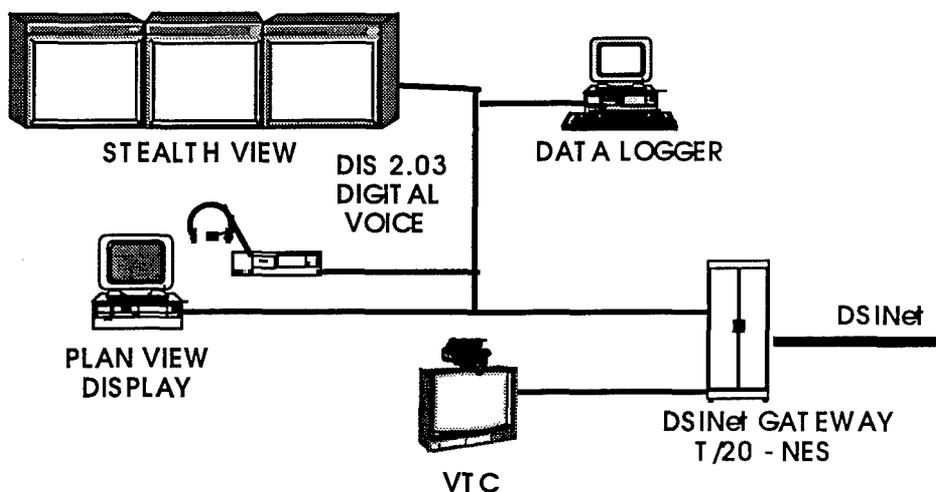

Figure 3. Institute for Defense Analyses Configuration.

Mounted Warfare Test Bed. The MWTB provided the majority of the combat forces used in MDT2. Seven manned simulators, M1A1 tanks and M2 Bradley fighting vehicles, were used by members of the battalion to realistically maneuver around the battlefield in order to exercise command and control. Additional command and control was provided from a manned battalion Tactical Operations Center (TOC) located within the MWTB. The TOC was staffed by the battalion's intelligence staff (S-2), operations staff (S-3), and members of Air Force Tactical Air Control Party (TACP). The MWTB also provided Modular Semi-Automated Forces (ModSAF) representing both the friendly and enemy forces. In addition, the MWTB had both Stealth and After Action Review (AAR) capabilities available for the trainers and observer/controllers (O/Cs). Figure 4 illustrates the MWTB configuration used for MDT2.
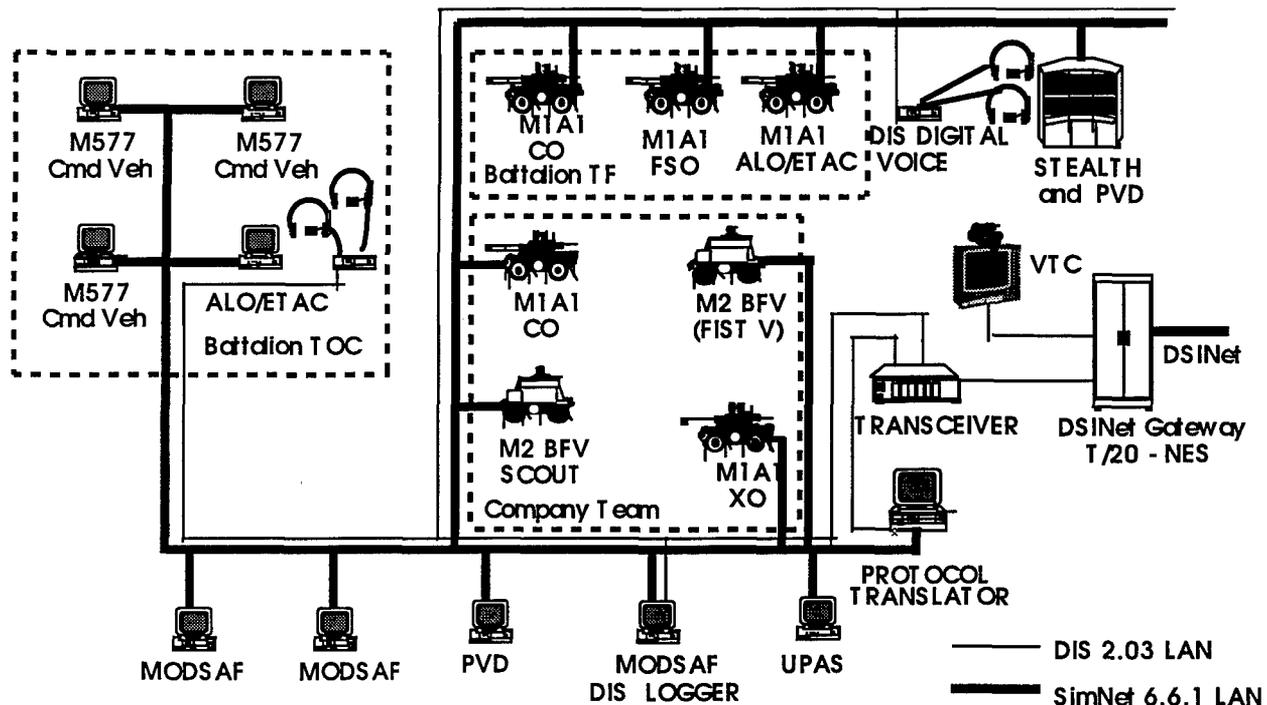
Figure 4. Mounted Warfare Testbed Configuration.

Because the MWTB uses Simulator Networking (SIMNET) protocols to communicate simulation data across its LAN, a SIMNET/DIS protocol translator was required. This translator, developed under the direction of the US Army's Simulation and Range Instrumentation Command, was hosted on a Sun[2] workstation. It converted the MWTB's SIMNET protocols to DIS 2.0.3 protocols and vice versa.

The MWTB used existing analog equipment for simulated radio communication between MWTB simulators and between these simulators and the TOC. A DIS Digital Voice System (DDVS) was also installed in the MWTB. The DDVS provided external communications between the combat elements within the MWTB and the other sites. This DDVS is described in Section 5.

Naval Air Warfare Center Aircraft Division. The NAWC/AD's Manned Flight Simulator Facility provided an OV-10 simulation. This OV-10 simulation allowed a Tactical Air Controller-Airborne (TAC-A) to detect and identify targets, mark targets using simulated white phosphorous rockets, and assess battle damage. Figure 5 shows the network configuration used for MDT2.

---

[2] Manufacturer or vendor names are used to describe actual hardware and software used in the MDT2 program and do not represent government endorsement of the items described.
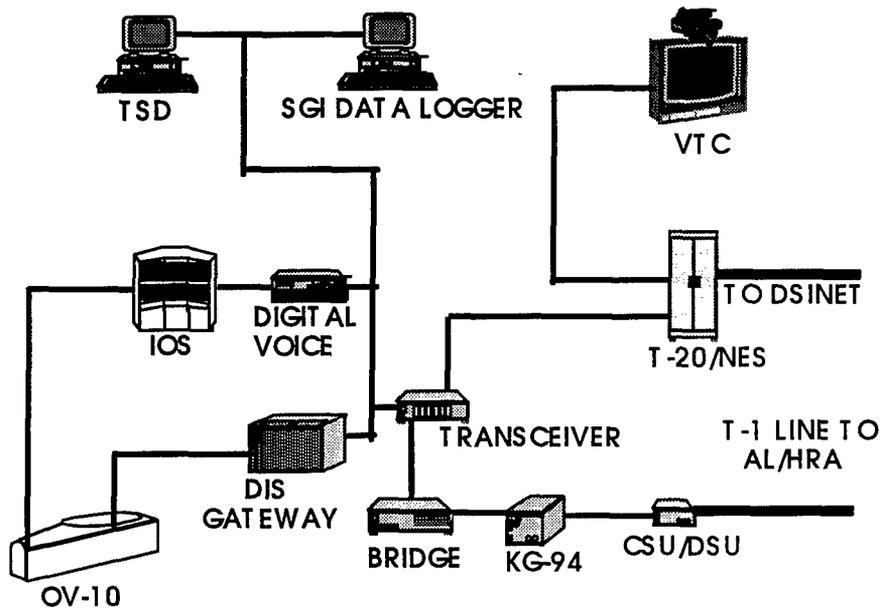
Figure 5. Naval Air Warfare Center Configuration.

3. Simulator Database

The virtual environment used for MDT2 was the National Training Center (NTC) at Ft. Irwin, CA and the surrounding area shown in Figure 6. The armor task force at the Mounted Warfare Test Bed (MWTB) at Ft. Knox, KY used the smaller 50km by 50km crosshatched square as their area of operations. This area included the actual maneuver area used by ground forces while training at the NTC. Selected portions of this 50km by 50km area were also modeled for use in the DFO-MULE simulator. The flight simulator databases at AL/HRA and NAWC/AD included the entire area shown in Figure 6. This larger area included actual contact points used by aircraft providing CAS during training exercises at the NTC.
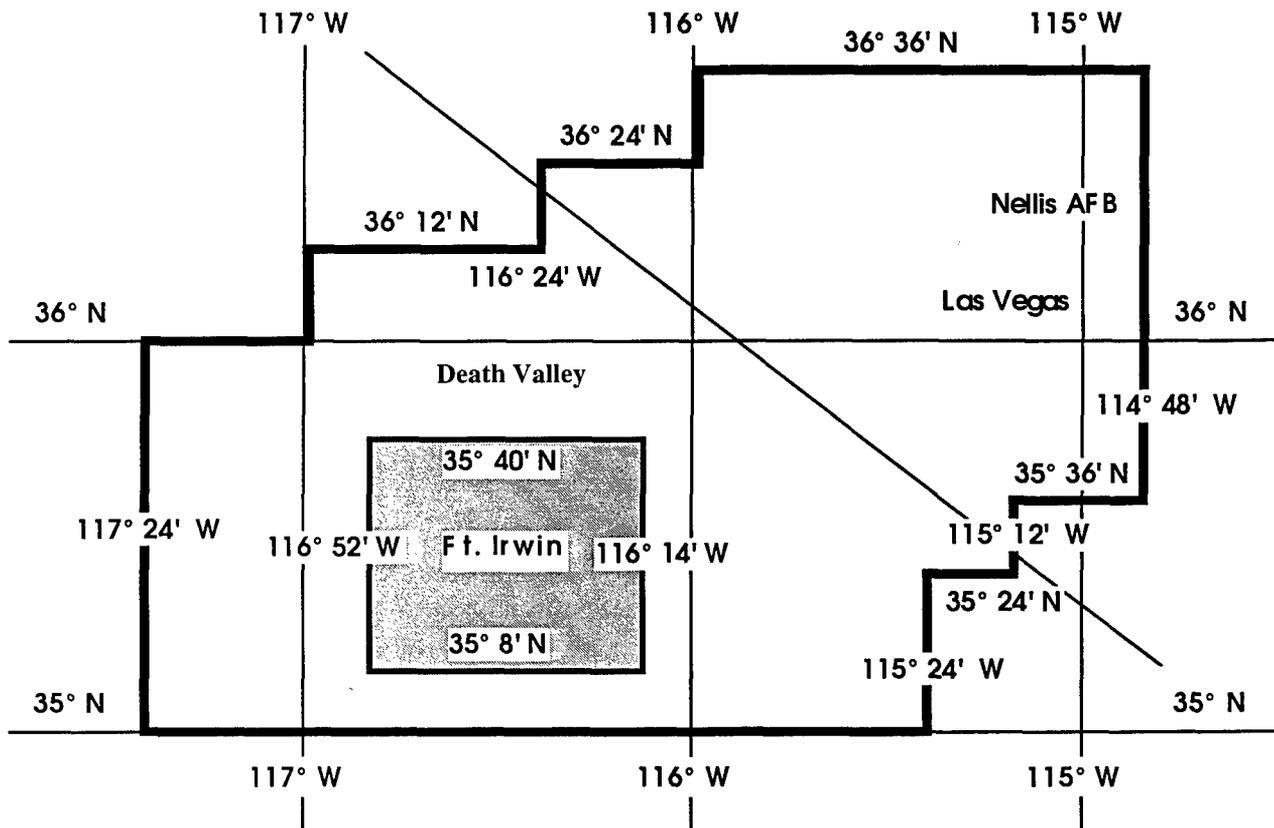
Figure 6. MDT2 Simulator Database

Although each of the sites attempted to create a common virtual environment representing the NTC, the depiction of this virtual environment was not identical at each site. Differences in computer image generators and display systems caused the field of view, terrain resolution, feature density, number of moving models, and special effects to differ between sites. Two approaches were taken to minimize the potential impact of these differences. First, rather than reduce the capability of all the simulators to match the lowest level of simulator performance, the impact of these differences was minimized by managing the training scenarios. Second, to ensure that vehicles and explosions were correctly depicted in each simulator, ground

vehicles and weapon impacts were clamped to the terrain surface as it was depicted within each simulator. This terrain clamping was accomplished by substituting the local terrain elevation for the entity elevation value transmitted between sites. This terrain clamping minimized the effect of differing terrain resolutions among the various simulators.

4. Communication Architecture

Wide Area Network. Since the MDT2 network operated at Secret/NOFORN, each of the sites also operated at the Secret/NOFORN level. Each site's LAN was connected to the MDT2 WAN through National-Security-Agency approved Type 1 encryption devices. These devices encrypted the data prior to transmission over commercial communication lines and decrypted the information at the receiving LAN. Within each site's LAN, SimNET, and/or DIS protocols provided intrasite communication. Network Interface Units (NIUs), DIS Gateways, or protocol translators converted simulation data to DIS 2.03 format for inter-site communication.

Figure 7 illustrates the basic communication architecture used to link the separate LANs together for MDT2. All simulation data (e.g., entity state information, event information, and tactical voice) was communicated digitally between sites. The MWTB, NAWC/AD, and IDA were linked using the DSINet. A secure DSINet gateway (Red and Black T/20s and Motorola Network Encryption System) provided the WAN interface between these sites and the DSINet. AL/HRA was connected to the DSINet through NAWC/AD. This connection consisted of common gateways at AL/HRA and NAWC/AD. Each site's gateway consisted of an ACS 4100 bridge/router, a KG-94 encryption device, and a T-1 CSU/DSU. These gateways were linked by means of a dedicated T-1 line. Thus, data from both the MWTB and IDA flowed through NAWC on its way to AL/HRA and vice versa.

The DSINet also provided unsecured video teleconferencing among all sites for feedback during AARs. This VTC capability, added during the second phase of MDT2, allowed the exercise director at the MWTB to conduct a common After Action Review (AAR) or debrief after each day's exercise. The unclassified VTC-based AAR allowed all of the trainees the opportunity to view replays of battle segments, operational graphics, and summary data. In addition, it allowed the trainees to observe and talk with their trainees at other sites. The DSINet linked the common VTC equipment at each of the four MDT2 sites. Figure 7 shows how this PicTel VTC equipment was connected to the DSINet through the DSINet T-20 gateway. DSINet PicTel capability existed at IDA and the MWTB prior to MDT2. PicTel VTC equipment was added to both AL/HRA and NAWC/AD specifically to support MDT2. In addition, a DSINet connection was added to AL/HRA to support the VTC AAR. The DSINet connection at AL/HRA was not integrated to their simulation LAN during MDT2.
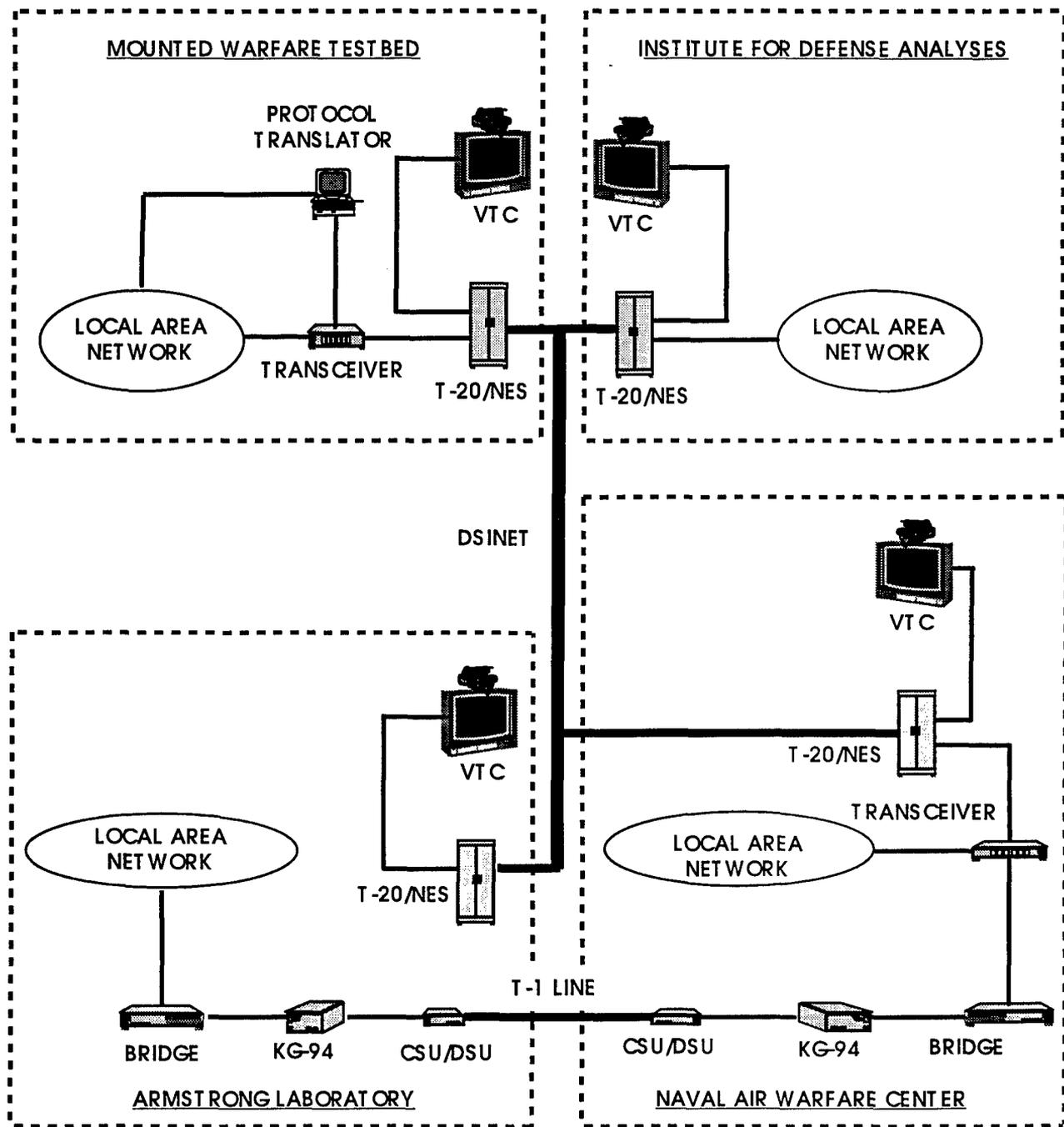
Figure 7. MDT2 WAN Communication Architecture.

Communication Bandwidth. The dedicated T-1 line connecting Armstrong Laboratory to NAWC/AD and all DSINet T-1 lines were capable of transmitting data at 1.54 Mbps. The requirement for secure communications over the DSINet, however, limited usable bandwidth to the capability of Motorola's Network Encryption System (NES) to encrypt and decrypt DIS simulation packets. Maximum throughput of the NES was limited to 200 packets per second (pps). In addition, previous DIS exercises had indicated that data rates in excess of 150 pps

degraded the performance of the NES and that a sustained throughput above 150 pps frequently crashed the DSINet. Therefore, a maximum rate of 150 pps was set as a system constraint. Using packet rate estimates shown in Table 1, total bandwidth requirements were estimated for the proposed CAS scenario. These estimates were used to bound the size of the simulated battles. Data obtained during the course of MDT2 indicated that the values shown in Table 1 overestimated the actual packet rates. Ground entities generated only about half the estimated number of pps and the DDVS produced approximately 20 pps instead of the estimated 32 pps.

Table 1. Estimated Packets/Second.

System/Entity	Packets/Sec	Number of Systems/Entities	Total
Ground Vehicles	1	60	60
F-16C	8	2	16
OV-10	8	1	8
DFO-MULE	10	1	10
Digital Voice	8	4	32
Total			126

5. Voice Communications

Requirements. MDT2 required three separate communication networks. One network had to provide tactical communications for the simulation participants. A second network was needed to support the training and administrative communication between O/Cs at different sites. Finally, a third communication network was required to support technical communication regarding network operation and simulator control. The DDVS provide two separate communication networks to support the CAS tactical and training/administrative communications. A telephone conference call linked technical personnel at each site for exercise monitoring and provided backup communication between O/Cs.

Table 2 lists the WAN communication links used for MDT2. Communication links A through D used the DDVS. Communication link E uses the existing Simvad digital voice system at Ft. Knox for intrastate communication. The Simvad digital voice system was already integrated with the MWTB's SIMNET LAN. This system was used for all tactical communications within MWTB. The protocol translator blocked Simvad digital voice data so that it was not communicated across the MDT2 WAN . Although the communication plan assigned links for the simulator operators and O/Cs, the DDVS allowed users to select alternative frequencies representing Ultra High Frequency and Very High Frequency radio channels.

Table 2. Voice Communication Plan.

	Communication Channel/Frequency				
	A	B	C	D	E
	289.60	371.10	335.80	125.00	Simvad
Tactical					
F-16 Lead		T/R	T/R		
F-16 Wing		T/R	T/R		
TAC-A		T/R	T/R		
ALO		T/R			T/R
DRO-MULE	T/R	T/R	T/R		
FSO/TFCO	T/R				
Observers/Controllers					
Armstrong Lab - MSS		R	R	T/R	
DFO/MULE IOS		R	R	T/R	
MWTB Stealth	R	R	R	T/R	T/R
PAX River TAC-A	R	R	R	T/R	
IDA Stealth	R	R	R	T/R	
MWTH TOC		R		T/R	

T = Transmit   R = Receive

DIS Digital Voice System. The DDVS provided tactical communication across the AL/HRA LAN, all WAN tactical communications, and was also the primary means of O/C communications. The DDVS units were distributed as shown in Figure 8. Each headset represents one physical or hardware channel.
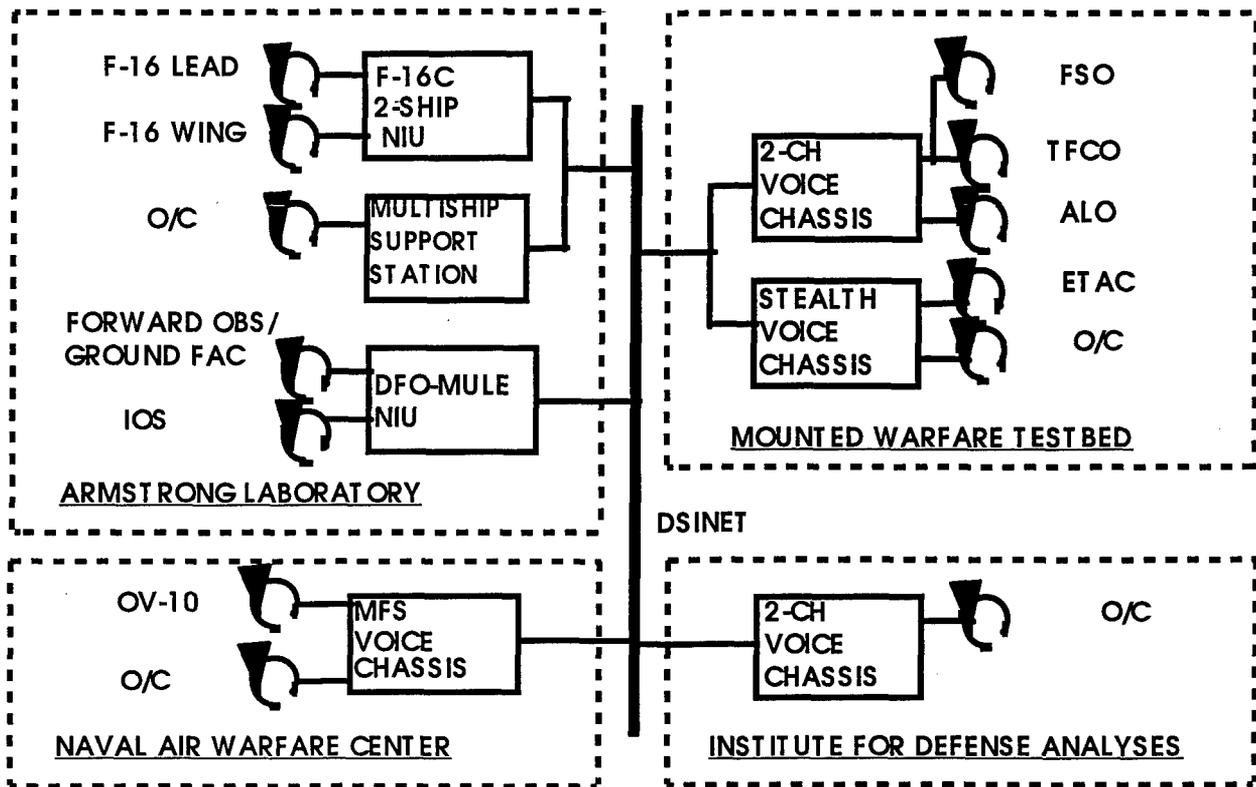
Figure 8. DIS 2.03 Digital Voice Systems

The DDVS is a VME-based system that includes a Motorola VME-147 processor board and a Vigra digital signal processing board. The system was connected to the simulator either through the simulator radio system, preserving the normal operator interface, or through a hand-held radio controller. The system only transmits to the network while push-to-talk is depressed.

The DDVS digitized and encoded the analog signal. For MDT2, Vector Quantization (VQ) was used to encode the voice data. This significantly reduced the bandwidth and packet count requirements on the WAN. Previous digital voice systems generally consumed large amounts of bandwidth for each system when transmitting, e.g., 40 packets per second involving over 64 kbps of data. However, using VQ, the DDVS broadcast 8 signal PDUs per second and used only 250 bytes per PDU.

The system for the F-16C MTTs provided one physical channel for each MTT. With one physical channel per MTT, the DDVS provides full communication capability for the F-16C on both UHF and VHF radios over any frequency selected by the pilot. On all other DDVS fielded for MDT2, hand-held radio controllers enabled operators to monitor up to five separate radio channels at once. Four of the five radios could be tuned to one of 20 preset frequencies. The other radio channel provided the manual capability to enter any radio frequency. The system was designed to transmit over one selected radio frequency at a time. However, a frequency was

reserved that enables designated individuals, e.g., exercise director, to receive all radio transmissions and to transmit to everyone independent of other DDVS frequency selections.

In addition to supporting voice communications, the hand-held controllers provided a means for O/Cs to input event report PDUs into the digital data stream. The event report PDUs provided a means of marking key events in the data logger files for the AAR as well as post exercise data analysis.

The DDVS also provided data latency information for post-exercise network analysis. With identical systems at all sites, a data query PDU was broadcast to all voice units. Each system would reply with a data latency PDU.

6.   Protocol Data Units

DIS 2.0.3 PDUs. Each MDT2 system was required to accept all DIS 2.0.3 PDUs and discard those which it did not use. Table 3 lists the PDU types generated by one or more of the MDT2 systems and broadcast over the WAN. It also shows whether or not a site transmitted (T), received (R), or both transmitted and received (T/R) those PDUs.

Table 3. Simulator PDU Matrix.

PDU	DIS-Based Systems					
	AL/ HRA	IDA	NAWC/ AD	Data Logger	Digital Voice	Stealth View
Entity State	T/R	R	T/R	R	R	R
Fire	T/R	R	T/R	R		R
Detonation	T/R	R	T/R	R		R
Collision	R			R		
Start/Resume	T/R		R			
Stop	T/R		R			
Acknowledge	T/R		T			
Event Report	T/R		T		T	
Message	T/R					
Emission	T/R					
Lase	R					
Transmit	T/R				T/R	
Signal	T/R				T/R	
Data						
Data Query						

	MWTB SimNET-Based Systems					
	Data Logger*	ModSAF*	Protocol Translator	Simulators*	UPAS*	Stealth View*
Entity State	R	T/R	T/R	T/R	R	R
Fire	R	T/R	T/R	T/R	R	R
Detonation	R	T/R	T/R	T/R	R	R
Collision	R	T/R	T	T/R	R	
Start/Resume			R			
Stop						
Acknowledge						
Event Report		T	T	T		
Message						
Emission						
Lase						
Transmit						
Signal						
Data						
Data Query						

* DIS - SimNET conversion through MWTB Protocol Translator
**Unit Performance Assessment System (UPAS)

Action Request, Action Response, Data, Data Query, and Set Data were also used on Armstrong Laboratory's LAN. These PDUs were sent point-to-point on the LAN and filtered out at the WAN gateway.

A number of systems required enumeration definitions not provided in the DIS documentation. The DFO-MULE and associated Laser information enumerations were defined for MDT2. The IRS for MDT2 included a number of other definitions for emissions, weapons, and management PDU fields that have been used on previous programs or defined specifically for the MDT2 CAS training evaluation that are not currently defined in the DIS enumerations. Table 4 provides a full listing of all the PDU enumerations defined by the IRS for MDT2.

Entity State PDU Transmission. The Entity State PDU was issued in accordance with the DIS 2.03 standard. The interval for transmitting an Entity State PDU update was 5 seconds if no other threshold or state changes generated an update. When an entity was removed from the network, that entity sent a final Entity State PDU with bit 23 of the appearance field in the entity state PDU set to 1, indicating that the entity no longer needed to be simulated.

DIS Management PDUs. Several DIS management PDUs were used. These management PDUs included:

— Event Report PDUs identified mission kills, debrief flags, and other CAS events such as wings level and cleared hot calls for debrief.

— The message PDU was generated by the DFO-MULE to record the CAS Joint Fire Brief (J-fire brief) on the data logger. When the FAC on the DFO-MULE station accepted the J-fire brief, the Message PDU was sent on the network for recording as a DIS PDU.

Data PDUs were used by Armstrong Laboratory's MSS and F-16C MTTs for mission initialization, Head-Up Display (HUD) information, weapons loading, and fuel changes during the mission. The digital voice system also used the data PDUs to obtain radio statistics and data latency information.

Table 4. DIS Enumerations Used for MDT2

Site Identification		Force Identification	
Site	**Field Value**	**Force Id**	**Field Value**
AL/HRA	14	Other	0
NAWC/AD	38	Friendly	1
MWTB	3	Opposing	2
IDA	16	Neutral	3

PDU Type		Dead Reckoning Algorithm	
Type	**Field Value**	**Method**	**Field Value**
Other	0	Other	0
Entity State	1	Static	1
Fire	2	F,P,W	2
Detonation	3	R,P,W	3
Collision	4	R,V,W	4
Create Entity	11	**Entity Marking**	
Remove Entity	12	**Character Set**	**Field Value**
Start/Resume	13	Unused	0
Stop/Freeze	14	Ascii	1
Acknowledge	15	**Detonation Result**	
Action Request	16	**Result**	**Field Value**
Action Response	17	Other	0
Data Query	18	Entity Impact	1
Set Data	19	Entity Proximate	2
Data	20	Ground Impact	3
Event Report	21	Ground Proximate	4
Message	22	Detonation	5
Emission	23	None	6
Laser	24	**Acknowledgment Flag**	
Transmitter	25	**Reason**	**Field Value**
Signal	26	Create Entity	1
Reason To Stop/Freeze		Remove Entity	2
Reason	**Field Value**	Start/Resume	3
Other	0	Stop/Freeze	4
Recess	1	**Laser Code Name**	
Termination	2	**Code Name**	**Field Value**
System Failure	3	Other	0
Security Violation	4	TBD	1
Entity Reconstitution	5	DFO/Mule*	50

* Developed/Modified for MDT2

Radio Signal Encoding Class	
Class	**Field Value Bits (15,14)**
Encoded Voice	0(0,0)
Raw Binary Data	1(0,1)
Application Spec	2(1,0)
Pre-Recorded Voice Pointer	3(1,1)

Radio Transmit State	
State	**Field Value**
Off	0
On/Not Xmitting	1
On/Xmitting	2

Event Type	
Type	**Field Value**
Other	0
Ran Out Of Fuel	1
Ran Out Of Ammo	2
Killed In Action	3
Damage	4
Debrief Flag*	5
Jfire Brief Accepted*	6
Depart Control Point*	7
Arrive Initial Point*	8
Cas Correction*	9
Cas Wings Level*	10
Cas Cleared Hot*	11
Cas Abort*	12

Radio Signal Encoding Type	
Type	**Field Value**
8-Bit Mu-Law	1
CVSD	2
Adpcm	3
16-Bit Linear Pcm	4
Pcm 8 Bit*	5
Alaw*	6
VQ*	7

* Developed/Modified for MDT2

Entity Enumerations							
Site	Entity	Kind	Domain	Country	Category	Subcategory	Specific	Extra
AL/HRA	F-16c	1	2	225	1	3	3	0
	Mk-82	2	12	225	2	9	0	0
	Gbu-10*	2	12	225	2	1	0	0
	Sa-4 Site*	8	1	222	2	2	4	0
	Sa-6 Site*	8	1	222	2	2	6	0
	Sa-4	2	1	222	1	15	0	0
	Sa-6	2	1	222	1	17	0	0
	Zsu-23/4	1	1	222	4	18	0	0
	Dfo-Mule*	1	1	225	55	1	0	0
	Willie Pete*	2	10	225	2	1	0	0
	Quarry*	5	1	0	8	60	0	0
	Power Plant*	5	1	0	10	80	0	0
	Tank Convoy*	5	1	0	21	40	0	0
	Radar Group*	5	1	0	21	60	0	0
	Vehicle Cluster*	5	1	0	21	80	0	0
	Two-Story Bldg	5	1	0	8	60	0	0
	Cbu 87	2	12	225	2	6	0	0
	Chaff (U.S.)*	2	3	255	1	1	0	1
	Flare Mju 7*	2	3	225	1	1	0	2
	Flare Mju 10*	2	3	225	1	1	0	3
NAWC/AD	0v-10	1	2	225	5	3	0	0
	Willie Pete*	2	10	225	2	1	0	0
MWTB	M1A1 Abrams	1	1	225	1	1	1	0
	120mm	2	2	225	2	4	0	0
	155mm	2	2	225	2	5	0	0
	M2 Bradley	1	1	225	2	3	0	0
	25mm	2	2	225	2	1	0	0
	Tow Missile	2	2	225	1	1	0	0
	T-72	1	1	222	1	2	1	0
	125mm Cannon	2	2	222	2	7	0	0
	Bmp-1	1	1	222	2	1	0	0
	73mm	2	2	222	2	3	0	0
	30mm	2	2	222	2	2	0	0
	Zsu-23-4	1	1	222	4	18	0	0
	23mm (Anti Air)*	2	1	222	2	3	0	0
	Willie Pete*	2	10	225	2	1	0	0

* Developed/Modified for MDT2

Entity Appearance			
Attribute	**Bit Position**	**Description**	**Value**
Paint Scheme	Bit 0	Uniform	0
		Camouflage	1
Mobility Kill	Bit 1	None	0
		Disabled Appr	1
Fire Power Kill	Bit 2	None	0
		Disabled Appr	1
Damage	Bits 3-4	None	0
		Slight	1
		Moderate	2
		Destroyed	3
Smoke	Bits 5-6	None	0
		Plume Rising	1
		Engine	2
		Plume & Eng	3
Trailing Effects	Bits 7-8	None	0
		Small	1
		Medium	2
		Large	3
Hatch	Bits 9-11	N/A	0
		Closed	1
		Popped	2
		Popped/Person	3
		Open	4
		Open/Person	5
		Unused	6,7
Lights	Bits 12-14	None	0
		Running	1
		Navigation	2
		Formation	3
		Unused	4,5,6,7
Flaming	Bit 15	None	0
		Present	1
Launcher	Bit 16	Not Raised	0
		Raised	1
Camouflage Type	Bits 17-18	Desert	0
		Winter	1
		Forest	2
		Unused	3
Concealed	Bit 19	None	0
		Concealed	1
Unused	Bits 20-22		
Status	Bit 23	Normal	0
		Stop DR	1
Unused	Bits 24-31		

* Developed/Modified for MDT2

Burst Descriptor		
Attribute	**Type**	**Field Value**
Warhead	Other	0
	High Explosive	1000
	Plastic, He	1100
	Incendiary, He	1200
	Fragmentation	1300
	Anti-Tank,He	1400
	Bomblets, He	1500
	Shaped Charge	1600
	Smoke	2000
	Illumination	3000
	Practice	4000
	Kinetic	5000
	Mines	6000
	Nuclear	7000
	Chemical, Gen	8000
	Chem, Blister	8100
	Chem, Blood	8200
	Chem, Nerve	8300
	Biological, Gen	9000
Fuse	Other	0
	Contact	1000
	Cont, Instant	1100
	Cont, Delayed	1200
	Timed	2000
	Proximity	3000
	Command	4000
	Altitude	5000
	Depth	6000
	Acoustic	7000

7.   Laser -Guided Munitions

Development Activities. Simulation of laser designation and laser guided munitions required a number of development activities. These activities included:

- Modifying the Laser PDU to make a 16-bit integer field for the laser code.

- Defining the transmitted coordinates of the laser spot with respect to a lased entity based on the origin of that lased entity's coordinate system.

- Ensuring that the number of pixels representing the laser spot diameter was independent of the distance of the target from the laser.

- Calculating and transmitting the laser spot intersection with terrain when the laser spot was not incident to an entity.

- Developing a first-order reflected energy model based on a 70-degree reflection "cone" on either side of the laser line of incidence.

- Modifying the F-16 MTT simulation software so that the LGB would fly an appropriate aerodynamic based on changes in the location of the laser spot during a bombs flight.

The implemented system was tested and found to successfully support simulation of laser designation by the DFO-MULE and delivery of LGBs by the F-16s. System testing indicated that simulated LGB flyouts were sensitive to the location of the laser spot. Feedback from subject matter experts indicated that this simulation adequately supported MDT2's training requirements.

PDU Modification. The DIS 2.0.3 Laser PDU was used to transmit laser designation information across the network. The DFO-MULE designated targets for the Laser-Guided Bombs (LGBs) released from the F-16Cs. The information contained in the various Laser PDU fields allowed for a straightforward implementation. The intention of the laser code field, however, is somewhat vague. As a result, this field was modified for MDT2.

The Laser code field in the DIS 2.03 standard is listed as an 8-bit enumeration. For MDT2, a padding field was used to extend the Laser code to a 16-bit integer. This allowed transmission of the 4-digit laser code used by the DFO/MULE and F-16C. The resulting Laser PDU used during MDT2 is represented in Table 5.

Table 5. Laser PDU.

FIELD SIZE (bits)	LASER PDU FIELDS	
96	Protocol Header	Protocol Version - 8-bit enumeration
		Exercise ID- 8-bit unsigned integer
		PDU Type - 8-bit enumeration
		Padding - 8-bits unused
		Time Stamp - 32 - bit unsigned integer
		Length - 16-bit unsigned integer
		Padding - 16 bits unused
16	Code Name	16-bits enumeration
48	Lased Entity Id	Site - 16-bit unsigned integer
		Host - 16-bit unsigned integer
		Entity - 16-bit unsigned integer
16	Laser Code	16-bit integer
32	Laser Power	32-bit floating point
32	Laser Wavelength	32-bit floating point
96	Laser Spot With Respect To Lased Entity	X-Coordinate - 32-bit floating point
		Y-Coordinate - 32-bit floating point
		Z-Coordinate - 32-bit floating point
192	Laser Spot Location	x-Coordinate - 64-bit floating point
		y-Coordinate - 64-bit floating point
		z-Coordinate - 64-bit floating point

8. Additional Implementation Details

Time Synchronization. Simulation time was used as the time stamp on all PDUs transmitted between sites. The exercise director at the MWTB issued a time hack over the DDVS. AL/HRA then broadcast an Action Request PDU containing the Timebase datum record. That Action Request PDU initialized the exercise start time at zero. Simulation time incremented in real-time from this exercise start time throughout each day's exercise. Following the Action Request PDU, AL/HRA broadcast a Start/Resume PDU. The Start/Resume PDU header timestamp reset the simulation time in any systems unable to process the Action Request PDU Timebase.

Kill/Damage Assessment and Reporting. Kill/Damage assessment was conducted according to the DIS standard. The target entity identified in the detonate PDU, determined self-damage based on the detonation location given in body coordinates. All other entities compared the detonation location to their position in world coordinates.

Each entity destroyed by a detonation issued an Event Report PDU using the "killed in action" event type. SimNET "deactivate" or "appearance" PDUs describing a killed entity were mapped to the DIS 2.03 Event Report PDU.

Dead Reckoning. MDT2 used DIS Dead Reckoning methods 1, 2, and 4.

Network Load Estimates. The MDT2 WAN was capable of sustaining network loads of 150 packets per second of DIS simulation traffic. Network loading was estimated as shown in Table 6.

Table 6. Network Loading Estimates.

System	Packet Rate (Packets Per Second)	Max Number On Network	Total Packet Rate
Ground Entities	0.5	130	65
Aircraft	8	3	24
Radar (ATES)	.2	5	1
DFO-MULE (Laser On)	10	1	10
DIS Digital Voice	8	3*	24
Total	26.7	142	124

These estimates were for the overall amount of traffic carried over the WAN. It is important to remember that the WAN load may exceed the capabilities of individual sites or simulators. Therefore, each site's LAN capacity must also be considered while developing scenarios to ensure loading is within each LAN's capability. For MDT2, LAN load was not a limiting factor.

PDU Data Logging. All sites logged simulation data using the DIS data loggers. The MWTB logged all DIS, SimNET, and digital voice communications. Debrief flags could be set

in the data stream using the DIS Digital Voice System. In addition to debrief flags, O/Cs could use the DDVS to send Event Report PDUs to the network for data logging. An event type could be selected on the DDVS hand-held controller and sent when at the time a specific event type has occurred. The Event Report PDU included the specific event type and a timestamp. In addition to the event types listed in the DIS standard, the event types listed in Table 7 were also defined for MDT2.

Table 7. Event Report PDUs.

EVENT TYPE	PDU FIELD VALUE
DEBRIEF FLAG	5
JFIRE BRIEF ACCEPTED	6
DEPART CONTROL POINT	7
ARRIVE INITIAL POINT	8
CAS CORRECTION	9
CAS WINGS LEVEL	10
CAS CLEARED HOT	11
CAS ABORT	12

9. Bibliography

DMA TR 8350.2 - Department of Defense World Geodetic System 1984 (WGS 84), Its Definition and Relationships with Local Geodetic Systems. Defense Mapping Agency Technical Report 8350.2, 1987.

Enumeration and Bit Encoded Values for Use with Protocols for Distributed Interactive Simulation Applications (T-CR-93-19). Institute for Simulation and Training, University of Central Florida, June 15, 1993.

IEEE Standard 754-1985 - IEEE Standard for Binary Floating Point Arithmetic, IEEE Product No. SH10116. Institute of Electrical and Electronics Engineers.

IEEE Standard 1278.1, Standard for Distributed Interactive Simulation -- Application Protocols, 1995. Workshop on Standards for the Interoperability of Distributed Simulations . Institute of Electrical and Electronics Engineers, March 11-15, 1996, pp. 327-335.

Standard for Distributed Interactive Simulation--Application Protocols, Version 2.0, Fourth Draft (Revised). Institute for Simulation and Training, University of Central Florida, March 1994.

Standard for Information Technology - Protocols for Distributed Interactive Simulation (DIS) Applications, Version 2.0, Third Draft May 28, 1993. (Proposed IEEE Standard Draft).

10.   List Of Acronyms

AAR	After Action Review
AIU	Advanced Interface Unit
AL/HRA	Armstrong Laboratory/Aircrew Training Research Division
ATES	Automated Threat Engagement System
CAS	Close Air Support
DDVS	DIS Digital Voice System
DFO/MULE	Deployable Forward Observer/Modular Universal Laser Equipment
DIS	Distributed Interactive Simulation
DSINet	Defense Simulation Internet
HUD	Head-Up Display
IDA	Institute for Defense Analysis
IEEE	Institute of Electrical and Electronic Engineers
IRS	Interface Requirements Specification
J-Fire Brief	Joint Fire Briefing
Kbps	Kilobits Per Second
LAN	Local Area Network
LDRM	Laser Designation Rangefinder Module
LGB	Laser Guided Bomb
Mbps	Megabits Per Second
MDT2	Multi-Service Distributed Training Testbed
ModSAF	Modular Semi-Automated Forces
MTT	Multitask Trainer
MWTB	Mounted Warfare Test Bed
NAWC/AD	Naval Air Warfare Center/Aircraft Division
NES	Network Encryption System
NIU	Network Interface Unit
NSA	National Security Agency
NTC	National Training Center
O/C's	Observer/Controllers
PPS	Packets Per Second
PDU	Protocol Data Unit
SimNET	Simulation Networking
STP	System Test Plan
TAC-A	Tactical Air Controller-Airborne
TAC-G	Tactical Air Controller-Ground
TACP	Tactical Air Control Party
TOC	Tactical Operations Center
VQ	Vector Quantization
VTC	Video Teleconferencing
WAN	Wide Area Network
WSG84	World Geodetic System 1984

APPENDIX F

Exercise Training Review Tools

This appendix describes the methods and tools to collect data about MDT2-CAS as a training system. It provides feedback from the warfighter. This After Training Review (ATR) includes four sections: (1) Biographical Data Form, (2) Training-Value Questionnaire, (3) Training Objectives Survey, and (4) Exit Debrief and Group Interview. As "experts" in their jobs, the Observer/Controllers (O/Cs) and trainees use the ATR to judge the success of MDT2-CAS. System developers need such judgments, combined with training performance data from the exercises, to gauge the system's quality and utility.

Procedures for After Training Review

- Hand out biographical data form for completion by all O/Cs and trainees at all sites.

- Administer the Training-Value Questionnaire to O/Cs and trainees at all sites

- Administer the Training-Objectives Survey to O/Cs and trainees at all sites.

- Perform Exit Debrief and and Group Interviews

Biographical Data Form

This form surveys each O/C's and trainee's military background and role in MDT2. Since trainees may change roles across exercises, the biographical form should be given after the last exercise or as late in the training week as possible. In addition, modifications to this form can address prior experience which may affect the O/C's or trainee's judgement.

Last four digits of SSN ____   Date __/__/__

BACKGROUND AND ROLE(S) IN MDT2

The purpose of this questionnaire is to determine your unit affiliation and the role or roles that you played in the past training week.

<u>Demographic Information</u>

1. Provide the following information about your present job:

    a. Rank/Grade: _____

    b. Job Title/Duty Position:

    _____

    _____

    c. Military Unit:

    _____

    _____

    d. [Check one]: Active Duty ____ Reserves ____ National Guard ____

    e. Does your present job involve planning, executing, or training CAS?

    ___ No.
    ___ Yes. Briefly describe how your job involves CAS:

    _____

    _____

<u>MDT2 Training</u>

2. Indicate where you were physically located during the MDT2 training week:

    __ Fort Knox, KY   __ Mesa, AZ   __ Pax River, MD

3. What was your role in the simulated CAS missions? If more than one, assign "1" to the main role and then "2", "3" etc., to additional roles.

Army:	Air Force:	Marines:
____ Bn/TF CMDR	____ CAS Pilot	____ MULE operator
____ S-3	____ ALO	____ Frwrd Obsrvr
____ S-2	____ ETAC	____ Ground FAC
____ FSO	____ O/C	____ TAC-A
____ Asst. S-3	____ Other: _____	___ O/C
____ FSE NCO		____ Other:_____
____ Co/Tm CMDR		
____ Pl Ldr		
____ FIST Chief		
____ Scout		
___ O/C		
____ Other: _____		

Training-Value Questionnaire

This questionnaire asks about how well MDT2-CAS served a unit's need. It should be administered by a member of the MDT2 training staff after a minimum of two training Simulation Exercises (SIMEXs) and related AARs. Schedule two minutes per item to allow time for written comments.

Last four digits of SSN   **Date**

Instructions: Please give us your opinions about the value of MDT2 for muliti-service training of close air support. For each of the following statements about MDT2, place an "X" in the space to indicate the extent to which you *agree or disagree*.

We would appreciate comments or examples, especially if you disagree with the survey item.

1. Need for Training Provided by MDT2

a. The opportunity provided by MDT2 to practice with personnel from other services is necessary for training CAS.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

b. MDT2 is a good training system for CAS because it focuses on critical training needs.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

c. Given the opportunity, I would like to train with MDT2 on a periodic basis.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

2. Credibility

a. MDT2 can be an effective trainer for CAS with only a few, minor modifications.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

b. A positive aspect of MDT2 is that it gives more realistic feedback to participants regarding CAS "kills" than is possible in field exercises or at Combat Training Centers.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

c. I can apply more realistic CAS tactics in MDT2 than I can in field exercises or at Combat Training Centers.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

3. Multi-Service Value

a. Experience on MDT2 made me better able to interact with members of other services to plan for and execute CAS missions in combat.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

b. Training with MDT2 gave me a better understanding of the jobs and roles of personnel from other services in planning and conducting CAS.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

4. Role in Training Cycle

a. Experience on MDT2 better prepared me for field exercises on CAS missions, such as those at Air Warrior and NTC.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

b. Training on MDT2 supplemented training in CAS that I receive within their military service.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

5. Expected Impact

a. The training that MDT2 provided can be applied directly to combat.

strongly agree	moderately agree	slightly agree	slightly disagree	moderately disagree	strongly disagree

Comments or examples? _____

_____

_____

_____

b. Estimate the extent to which your experience with MDT2 has affected your ability to perform your role in a mission that uses CAS.

a.

no change in combat effectiveness	slight increase in combat effectiveness	moderate increase in combat effectiveness	large increase in combat effectiveness	extreme increase in combat effectiveness

b. Comments or examples? _____

_____

_____

Training-Objectives Survey

The O/Cs and trainees use this survey to judge how well the simulation and the mission scenarios for MDT2-CAS satisfied the training objectives. This survey should be given by a member of the MDT2-CAS training staff toward the end of the training week. Schedule
3 minutes per item. Each player will need to read a description of each objective, respond to check-list questions, and write comments.

The set of all training objectives for MDT2-CAS are shown earlier (Appendix A). For routine training on CAS, commanders of each of the participating units and their staffs would select a subset of training objectives for emphasis. The assessment sheets for these objectives would be assembled in customized packages as part of training preparations. Use these data to check for agreement on the importance of the TOs for joint training and on how well MDT2 satisfied them. Low ratings or disagreements are 'red flags'. Comments and debriefings may point to changes needed in simulation or scenario design.

The inclosed set is an example from Fort Knox. Additional sets were tailored for the Air Force and Marine Corps participants. The inclosed set contains 7 key training objectives ("CAS tasks of special interest for MDT2") out of the total set of 25 shown in Appendix A.

BN Staff and ALO Survey Example

This questionnaire has two (2) parts. Part A contains CAS tasks of special interest for MDT2. Part B contains other CAS tasks. Most of the instructions are the same for both sets of tasks. Part A asks for one additional rating for the task and has more emphasis on comments than Part B.

PLEASE REMOVE THE FIRST TWO (2) PAGES TO USE FOR REFERENCE DURING YOUR RATINGS.

PART A

Purpose: The purpose of this survey is to determine the ability of MDT2 to provide training on selected close air support (CAS) tasks. These tasks conform to current CAS doctrine and emphasize the multi-service nature of CAS. In addition to a short title, each task is described by conditions, actions, and outcomes.

Instructions: Read the complete description of each task and then answer the following questions:

1. **Participation or Observation**. Indicate whether or not you participated in or observed this task during the MDT2 demonstration. If not, skip the three remaining questions and go to the next task.

2. **Priority**. Rate the relative importance of receiving training on each task *in addition to training you have received* from your service or in multi-Service military exercises. Use the following definitions to rate the priority of each task:

GRADE	Definition
A	Additional training for this task is essential.
B	Additional training for this task is highly desirable.
C	Additional training for this task is desirable.
D	Additional training for this task is somewhat desirable.
E	There is no need for additional training for this task.

3. Ease of Use. Please rate how easy it was to use MDT2 to train on the task. Place an "X" in the space provided to indicate the ease or difficulty of MDT2 use.

4. **Training effectiveness**. Rate the extent to which MDT2 provides effective training on the task. Use the following scale to rate the training effectiveness of MDT2 for each task:

GRADE	Definition
A	Provides all required training for this task.
B	Provides more than minimal essential, but not all required training for this task.
C	Provides minimal essential training for this task.
D	Provides some training, but less than minimum essential training for this task.
E	Provides none of the required training for this task.
F	Provides negative training for this task.
NR	Not rated or does not apply.

5. **Comments**. We would appreciate comments or examples, so that we can better evaluate MDT2. For example, if you checked A or B, did something stand out in the training of the task being rated? If you checked D ("less than minimal training"), what is missing, or what would it take to increase your rating?

Part A contains 7 key tasks that directly pertain to battalion staff, including the ALO. Specific activities performed by the battalion staff are marked with a check mark (✓). Rate each using the definitions provided above. To remind you of these rating definitions, remove these instructions from the rest of the survey and keep them in front of you as reference as you rate each task.

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Integrate CAS and other fire support elements with maneuver actions.

Conditions: The staff has received and understands the Bn/TF commander's concept of the operation. The staff has also been given the brigade priority/availability of fires.

Actions: The CAS plan is a subset of the fire support plan and conforms with the details of the Bn/TF maneuver plan and the Bde Fire Plan[b].

✓1. In consultation with the S-2, the S-3, and the ALO, the FSO generates a list of targets. In generating the list, staff must keep in mind that CAS targets must

    (a)   have a purpose;
    (b)   result from the intelligence preparation of the battlefield (IPB);
    (c)   represent a high payoff target (HPT);
    (d)   key on enemy, engagement areas, obstacles;
    (e)   be based on the commander's intent and attack guidance; and
    (f)   be manageable in number (i.e., 3-5 per company/team).

✓2. The staff prepares a Fire Execution Matrix, which is a graphic portrayal of fire support allocations. The matrix lists fire support elements by maneuver phases, thereby establishing execution responsibilities and coordination instructions.

✓3. The Bn/TF Commander approves the Fire Support Plan.

Behavioral Outcome or Product: The approved OPORD Fire Support Plan and the Fire Execution Matrix. Effects are continuous throughout the battle.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    _____ No. Do not answer the questions on this page and proceed to the next task.
    _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

<u>Title</u>: Institute fire support control/coordination measures

<u>Conditions</u>: The Bn/TF has been provided with a coordinated fire line (CFL) and a fire support coordination line (FSCL). The TF commander has issued his concept of the operation including designation of high value targets (HVT) and high payoff targets (HPT).

<u>Actions</u>: In support of the maneuver plan, the staff develops a fire support plan that institutes the following fire support coordination measures:

✓1. designates restricted fire lines (RFL), restrictive fire areas (RFA), and no fire areas (NFA);

✓2. designates airspace coordination areas (ACA), critical friendly zones, and call-for-fire zones; and

✓3. establishes recognition and authentication procedures, a Fire Support Execution Matrix, and a Fire Support Attack Matrix.

<u>Behavioral Outcome Or Product</u>: The Fire Support Annex to the OPORD. Effects are continuous throughout the battle.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    ____ No. Do not answer the questions on this page and proceed to the next task.
    ____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Initiate airspace coordination areas (ACA).

Conditions: CAS missions are planned (formal ACA) or CAS missions are to be executed on an immediate basis (informal ACA).

Actions: The FSO institutes measures to restrict fires into CAS airspace. To accomplish this, the following actions are taken:

1. If time permits, a formal ACA is deliberately planned. A formal ACA is a three-dimensional block of space in which aircraft are free to maneuver. Direct and indirect fires can be delivered, over, under, and around but not into the designated ACA. A formal ACA is the more desirable alternative because (a) it restricts less airspace; (b) allows tasking missions with the proper ordnance, sufficient time for planning, and integration of CAS mission with other missions; and (c) allows concentration of CAS, and avoids spreading CAS assets too thinly (piecemealing).

2. An informal ACA is the more likely alternative given the dynamic, fluid, and unpredictable nature of the battlefield. An informal ACA is simply a procedure for insuring separation of aircraft and surface fires. Fire support personnel should select a separation technique that requires the least coordination between air and firing units without adversely affecting the aircrew's ability to complete the mission safely. Aircraft and surface fire may be separated by distance or by time. Distance separation requires less detailed coordination than time separation but can be more restrictive for aircraft routing.

✓3. The FSO and ALO determine the appropriate airspace coordination measures. If the measures are too restrictive, the ability to achieve synergy of fire will be reduced. If the measures are too lax, the aircraft may be endangered by ground fire. Specially, (a) the ALO determines the characteristics of the aircraft/mission and translates that into airspace requirements and the time the ACA must remain in effect; and (b) the FSO considers the characteristics of the weapons available for indirect fires to avoid firing into the ACA.

✓4. The ACA measures are presented to the commander who determines their impact on his operational mission. The benefits of CAS may not be justified by the restrictions imposed by the ACA.

✓5. Given an approved ACA, the FSE plots and controls supporting fires in conjunction with the ACA.

6. Given an approved ACA, the TAC-A controls CAS aircraft to maneuver within ACA.

Behavioral Outcome or Product: ACA is documented in the Fire Support Plan Annex to the OPORD and/or the ACA plots in the FSE. The ultimate desired outcome is the least restrictive ACA in which CAS aircraft can operate safely and effectively. ACAs are also developed during the battle, particularly during immediate missions.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    _____ No. Do not answer the questions on this page and proceed to the next task.
    _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

     A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

     A   B   C   D   E   F   NR

5. Comments or examples on your rating?

| |
| |
| |

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Incorporate SEAD in the fire plan.

Conditions: Enemy air defense assets have been identified and are located in the Bn/TF area.

Actions: To plan for the suppression of enemy air defense (SEAD):

✓1. FSO coordinates with the S-2 and S-3 to identify air defense assets and probable locations.

✓2. During planning, FSO plots probable locations for suppressive indirect fires. FSO also plans for subordinate commanders to use against air defense targets of opportunity. Indirect fires must conform with ACA.

✓3. During execution, FSO coordinates SEAD fires with the CAS delivery, such that fires impact one minute before the strike and continue for one minute after the aircraft have departed.

✓4. FSO synchronizes timing of air attack by relaying information about SEAD through the ALO to CAS pilots and the TAC-A.

Behavioral Outcome or Product: Enemy air defense capability is effectively suppressed. No aircraft are lost to enemy air defenses.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

_____ No. Do not answer the questions on this page and proceed to the next task.
_____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Update airborne pilots as necessary.

Conditions: Subordinate elements have reported changes in the tactical situation since the initial brief. Examples of tactical changes include movement of an enemy target, movement in the location of friendly forces, or a change in the status of enemy air defense artillery.

Actions:

✓1. The Bn/TF commander and his staff (including FSO) understand the input requirements for mission execution, and recognize changing tactical situations that impact on the mission.

✓2. The commander and/or staff normally direct the ALO to relay information to CAS pilots through the TAC-A. If close to air attack, this information may be communicated directly from the attack controller (ALO or ETAC) to the pilots.

Behavioral Outcome or Product: The pilots receive timely communication that accurately describes the changes in the tactical situation and its impact on the CAS mission.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

   _____ No. Do not answer the questions on this page and proceed to the next task.
   _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

   A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

   A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Control CAS air attack.

Conditions: CAS missions has been approved and scheduled in to the Bn/TF sector. An forward air controller is airborne and on station.

Actions: In preparation for the attack, these actions are taken:

✓1. The ALO and TAC-A may confer to determine who will control the air attack. The final controller should be the one who is best able to control the air strike and observe its effects. This choice is likely to be the TAC-A, but the ALO or ETAC are both qualified air controllers who may be selected if they have a better line of sight.

✓2. The ALO identifies back-up elements (normally the FSO) in the event a qualified controller (i.e., the TAC-A, ALO, or ETAC) cannot control CAS aircraft. This step must be performed in case the communications between the aircraft and the Tactical Air Control Party (TACP) are disrupted.

✓3. The ALO insures (in conjunction with the FSO) that all primary and back-up elements have proper frequencies, call signs, correct CEOI, and are all operating in the secure/unsecured mode. Failure to do so may result in disrupted or ineffective communications.

✓4. The ALO insures that the TAC-A is on station and has communications with ground elements and the CAS aircraft. This step is necessary to determine whether or not the back-up controller must be used.

Behavioral Outcome or Product: ALO establishes communication with pilots and all elements involved in the CAS mission. The resulting communications between controller and pilot are accurate and timely.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    _____ No. Do not answer the questions on this page and proceed to the next task.
    _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Synchronize CAS attack with other direct and indirect fires.

Conditions: CAS aircraft are airborne and prepared to start mission.

Actions:

✓1. FSO directs time hacks to insure that suppression of enemy air defenses (SEAD) fire impacts 60 seconds prior to aircraft arrival in area of responsibility (AOR) and continues 60 seconds after their departure from AOR. Failure to do so could result in CAS aircraft receiving fire from enemy air defenses.

✓2. FSO directs time hacks to produce simultaneous effects of CAS with other fire support systems. Effects on enemy are greater when indirect fires are used simultaneously with CAS than when indirect fire and CAS are employed separately.

✓3. Through the FSO, Bn/TF commander synchronizes maneuver force attacks with the CAS attack. Simultaneous direct fire should increase the synergy of CAS and indirect fires even further.

Behavioral Outcome or Product: CAS aircraft are not hit by SEAD fire. Direct and indirect fires are coordinated with CAS attack to produce simultaneous effects.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    _____ No. Do not answer the questions on this page and proceed to the next task.
    _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Update airborne pilots as necessary.

Conditions: Subordinate elements have reported changes in the tactical situation since the initial brief. Examples of tactical changes include movement of an enemy target, movement in the location of friendly forces, or a change in the status of enemy air defense artillery.

Actions:

1. The Bn/TF commander and his staff (including FSO) understand the input requirements for mission execution, and recognize changing tactical situations that impact on the mission.

✓2. The commander and/or staff normally direct the ALO to relay information to CAS pilots through the TAC-A. If close to air attack, this information may be communicated directly from the attack controller (ALO or ETAC) to the pilots.

Behavioral Outcome or Product: The pilots receive timely communication that accurately describes the changes in the tactical situation and its impact on the CAS mission.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

   _____ No. Do not answer the questions on this page and proceed to the next task.
   _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

   A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

   A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Instructions: Read the following description of task conditions, actions, and outcomes and then rate the task according to scales described in the instructions.

Title: Control CAS air attack.

Conditions: CAS missions has been approved and scheduled in to the Bn/TF sector. An forward air controller is airborne and on station.

Actions: In preparation for the attack, these actions are taken:

1. The ALO and TAC-A may confer to determine who will control the air attack. The final controller should be the one who is best able to control the air strike and observe its effects. This choice is likely to be the TAC-A, but the ALO or ETAC are both qualified air controllers who may be selected if they have a better line of sight.

2. The ALO identifies back-up elements (normally the FSO) in the event a qualified controller (i.e., the TAC-A, ALO, or ETAC) cannot control CAS aircraft. This step must be performed in case the communications between the aircraft and the Tactical Air Control Party (TACP) are disrupted.

✓3. The ALO insures (in conjunction with the FSO) that all primary and back-up elements have proper frequencies, call signs, correct CEOI, and are all operating in the secure/unsecured mode. Failure to do so may result in disrupted or ineffective communications.

✓4. The ALO insures that the TAC-A is on station and has communications with ground elements and the CAS aircraft. This step is necessary to determine whether or not the back-up controller must be used.

Behavioral Outcome or Product: ALO establishes communication with pilots and all elements involved in the CAS mission. The resulting communications between controller and pilot are accurate and timely.

---

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

    _____ No. Do not answer the questions on this page and proceed to the next task.
    _____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

    A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

    | Very Easy | Easy | Borderline | Difficult | Very Difficult |

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

    A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Last four digits of SSN _____   Date _____

<u>Title</u>: Conduct CAS attack.

<u>Conditions</u>: CAS pilots are airborne, briefed, and authorized to conduct CAS mission during the day with unlimited visibility. The TAC-A has taken over as final controller or has passed control to qualified ground personnel (ALO or ETAC).

<u>Actions</u>:

1. To insure that pilots are oriented on the enemy and not on friendly forces, only the final controller authorizes weapons release. The controller uses either direct and indirect methods to authorize the release: If the final controller can observe both the aircraft and target, he directly authorizes weapons release himself when he determines the aircraft is attacking the correct target. If the controller cannot see both aircraft and target, he uses the indirect method wherein he relies on information from someone observing the target to issue authorization.

✓2. For laser designated target, pilots make the following call to the laser designator team: "10 secs, laser on, spot, and terminate."

✓3. In response to pilot signals, laser designator illuminates the proper target at "laser on" and turns it off at "terminate."

4. For targets designated by other means (smoke, white phosphorus, etc.), the final controller describes where the target is in relation to marking rounds.

✓5. All personnel who are in a position to observe target effects report them up the ground and air chains.

6. The TAC-A evaluates target effects. If he determines that the commander's intent was not met, he recommends a target re-strike to the commander through the ALO. He also determines whether the same aircraft should be used for the re-strike.

7. If necessary, the Bn/TF commander authorizes a re-strike on the target.

<u>Behavioral Output or Product</u>: Aircraft destroys target without hitting friendly troops.

1. Did you participate in or observe this task being performed during the MDT2 demonstration?

_____ No. Do not answer the questions on this page and proceed to the next task.
_____ Yes. Respond to questions below.

2. Rate the priority for receiving additional training by circling the corresponding letter:

   A   B   C   D   E

3. Rate how easy it was for your to use MDT2 for this task.

Very Easy	Easy	Borderline	Difficult	Very Difficult

4. Rate the training effectiveness of MDT2 for this task by circling the corresponding letter:

   A   B   C   D   E   F   NR

5. Comments or examples on your rating?

Exit Debrief and and Group Interview

   After the last SIMEX, MDT2-CAS staff should debrief O/Cs and trainees separately in small groups at each site. For example, in MDT2, Battalion staff were interviewed as one group, company team members as a second group, and O/Cs as a third group. Such a break-out by echelon and type of participant encourages candid discussions. Allow one hour for the interview.

The following sections provide "Instructions for Conducting Interviews" and an "Interviewer Guide." The "Guide" contains broad open-ended questions as examples that were more detailed and site-specific in actual use.

Instructions for Conducting Interview

The following are general guidelines for conducting the post-training interviews.

1. Conduct the interviews, after the final battle and AAR have been completed. If you cannot schedule an interview at this time, conduct the interview as late in the training as possible. For example, you may be able to schedule participant interviews before the final AAR. The interviewees should have finished all written surveys by this time, but if they ~~haven't, give them time to complete the surveys before the interviews.~~

2. Tape record the interview. At the beginning of each recording, say the following information: (1) your name, (2) your location, (3) the date and time, and (4) the group you are interviewing (e.g., pilots, MULE O/Cs, etc.). Supplement the tape recordings with written notes in the space provided. If you make notes that are not on the interview forms themselves, please indicate on the notes the interview question to which they relate. Do a voice check on the recorder to be sure that the recorder is working and voices can be heard. For example, start the recorder, ask players to introduce themselves. In a very large group, ask a few people at the most distant locations to introduce themselves. Replay the recording. If audio is poor, try some adjustments, such as asking people to speak louder, move closer, or pass the microphone.

3. Start the session with an introduction such as the following:

> "I would like to take some time for a discussion about the training that has taken place this week. The focus is on the strengths and weaknesses of this type of multi-service training. I have a list of questions that I'd like to go through. After I read each question, let's discuss it."

Then, read the first question.

4. Use the basic techniques of "good listening." That is, ask for clarification or examples, paraphrase your understanding of a respondent's comment. ___Do not___ let a comment go by if it is not clear, or if it contains acronyms. Ask the interviewee to repeat or paraphrase comments and explain acronyms. Keep in mind that clerical personnel with little or no subject matter expertise will be ased to transcribe the tape recordings.

5. Ask probe questions to elicit more detail or to get contrasting or corroborative opinions. The follow-up questions may also help to clarify special perspectives of participants with different views of the battles. [Suggested probes were provided to interviewers in the MDT2 assessment.] Use any follow-up questions to find out useful information.

6. Maintain a neutral appearance to avoid interjecting your opinion by word, gesture, or posture.

7. When the interview is over, write the date and your location on the tapes.

Interviewer Guide

Location _____   Interviewer _____
Group _____   Date _____

1. What signficant training needs for your echelon and element were covered by the MDT2 training? How well were they covered? What needs were not covered?

2. What would you do to improve the following parts of the training system: (a) Preparation before coming here, (b) orientation on the first day of the rotation, (c) the simulation technology, and (d) the design of the mission scenarios for the SIMEXs?

3. What did you like most about this week's training? What did you like least?